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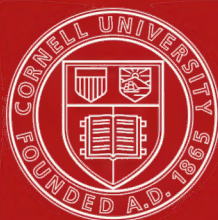


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The Honey Bee

BY

WHEELER DENNISON WRIGHT

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THE HONEY BEE

INTRODUCTION

The honey bee may well be counted as a friend of the human race, since besides furnishing large quantities of the most healthful sweet known, the commercial importance of which at this day is by no means insignificant, it is also of great value as a fertilizing agent to many of the crops produced by the farmer and horticulturist, obtaining results which could not otherwise be secured.

Beekeeping on a commercial scale is far from being a royal road to wealth as pictured by some, but requires as much labor, diligence and attention to details as many other lines of business. However, the thorough going apiarist, well adapted and educated to the business, given a good location and a favorable season, usually has no complaint to offer. As along other agricultural lines, weather conditions often exert an adverse influence and poor seasons intervene, which necessitate extra care, fortitude and enthusiasm on the part of the beekeeper, to safely bridge them over.

In a small way, beekeeping is quite popular as a recreation for persons of sedentary habits, also as a light employment for invalids, giving healthful open air exercise; at the same time affording mental relief.

The Empire State ranks high in the production of surplus honey and numbers its beekeeping specialists by the hundred. Its honey yielding flora is extensive and diversified.

The apiary inspectors of this department have for years given information and instruction on beekeeping to those desiring it — especially amateurs — and the object of this bulletin is to supplement such instruction with matter in suitable form for ready reference. Only such equipments as are admissible in the best modern apiary of the specialist are shown and recommended. These the beginner would do well to adopt at the start, so far as his necessities demand.

On account of the limited character of this bulletin many details are necessarily omitted. Those desiring to pursue the subject further are referred to the unabridged works on beekeeping enumerated herein.

LOCALITY

Doubtless there are but few localities in this state in which a few colonies of bees could not be kept with profit; but when a person expects to make a specialty of the business, it is highly essential that he should study thoroughly any given location to determine its possibilities in honey production, before he concludes to settle down permanently.

Some sections of the state, particularly the northern, furnish the finest quality of white clover honey obtainable. Years ago, basswood was a prolific source of honey in many localities, but it is fast becoming a thing of the past on account of its value for other purposes.

Some of the leading apiarists of central New York claim much for alfalfa as a honey yielder, but it has reached its greatest fame in the western states.

In sections where buckwheat is grown extensively a good yield is frequently obtained, and very seldom a total failure experienced, since the season of blooming is late (generally in August), and all colonies should be in condition to do good work. This is not always the case during clover and other early blooms.

Alsike clover is abundant in many sections, and is a splendid honey producer. Sweet clover (*mellilotus alba*), blue thistle, sumac and goldenrod are sometimes quite plentiful and add largely to the product of the apiary. Fruit bloom and black locust occasionally yield honey freely, but come on before most of the colonies are very populous, hence they do not afford much if any surplus, but are very useful to promote breeding.

A location where several of the above named sources of supply are abundant should give good returns in an average season.

Having found a desirable location as regards pasturage, etc., there is still one other very important point for consideration, namely, whether there are any apiaries of considerable size within four or five miles of the point in question. If so, the newcomer

is advised to pass along to a locality that is free from large apiaries, since most localities may be overstocked with bees, as many are at present.

It is the height of folly for an apiarist to locate an apiary near one already established, as the profits are then divided, the full amount of which might be enjoyed by each, if separated a few miles. In some sections and seasons this could make the difference between success and failure.

The number of colonies that may be kept in a single apiary with the maximum of profit can be determined only after a careful study of the resources of the section in which the apiary is located, within a series of years of experience, and by adapting the management and manipulation to the requirements of such locality. Seventy-five to one hundred colonies should be the limit until experience proves that the number may be increased. Many extensive apiarists, especially those who conduct several apiaries each, restrict the number to one hundred colonies or less, and place them four or five miles apart.

A gentleman of central New York for years limited his colonies to sixty, considering this number sufficient for the best results in his location, and he secures good yields of surplus comb honey, occasionally reaching an average of one hundred pounds per colony.

A prominent beekeeper of Long Island keeps but forty or fifty colonies in an apiary, and places the yards three or four miles apart, claiming that the flora of that locality will not profitably maintain a greater number.

There are localities in this state that are ideal in their capacities for honey secretion. Many of these are fully stocked with bees, while undoubtedly many others as good contain few, if any, bees. Some of these are necessarily somewhat remote from the railroads and principal thoroughfares, but the additional expense for transportation, etc., would find compensation in the larger yield to be obtained in an otherwise unoccupied location.

The successful apiarist must acquaint himself with the honey yielding flora of his locality, the time of blooming of each variety, and the length of time it may be expected to continue, that he may prepare for the harvesting of the surplus crop, by having his

apiary in proper condition at the right time, with the necessary equipment at hand and ready for application.

LOCATING AN APIARY

An ideal location for an apiary would be upon a dry, level or nearly level lot, protected from the prevailing winds by hills, trees or buildings. A gentle slope to the east or south would be desirable, with the hives facing these respective points. Hives may face any direction in summer but at other seasons, especially in the spring, it is desirable to have them so placed that they may receive the maximum amount of sunshine at the entrance for the protection of the foraging bees; and to avoid the entrance of cold winds.

The apiary should be placed a reasonable distance from dwellings and highways — one hundred feet or more — to avoid danger to people or animals from stings. It is easier and wiser to locate right at the outset than to adjust matters after harm is done, as it is better to be sure than sorry. A high screen or hedge intervening is a great protection at any point.

In most rural communities no land is too good to be occupied by an apiary, and scarcely any crop will produce an equal revenue. The writer has seen apiaries located in hog and hen yards, in stump and brush lots, in rough stone lots, and on steep sidehills and cliffs, where it was very inconvenient and moreover positively dangerous to handle bees or hives, their owners apparently thinking that any old place was good enough for bees, and withholding land that could be used for other purposes.

An orchard where the trees are not too thick is often a desirable place for bees, furnishing shade in hot weather for the benefit of both the bees and their keeper. There should be a good turf and the grass kept short, preferably with a lawn mower. Where convenient, sheep might be used to keep the grass down.

It is a good plan to place hives separately or in pairs with a convenient distance between for handling hives or honey, using a wheelbarrow — which is a very useful implement in the apiary — and swinging a scythe when it is necessary to cut grass in that way. Where land is plentiful, the rows may be placed eight feet or more apart, with hives six or eight feet apart in the row. Each hive should have a separate stand so that it can be

worked from any or all sides, or taken up complete and moved elsewhere.

Generally, bee houses or sheds should not be tolerated as it is very inconvenient to handle bees in them and they harbor insect enemies of the bees, such as spiders, wasps, etc., besides incurring a useless expense. There are occasional exceptions to this rule as where an apiary is situated in a locality infested by marauders. In this case a bee house of the style used by Mr. F. B. Loucks of Lowville, N. Y., might be desirable. Continuous benches or stands are open to practically the same objections.

Hives should stand moderately close to the ground — say from three to six inches — so as to improve their stability when tiered several stories high, and to enable the field bees to more readily gain the entrance in windy or cool weather. They should also be level both ways to give the yard a tidy appearance.

When the apiary exceeds the maximum in number for profit in a given locality, a portion of the stock should be disposed of or out-apiaries established, subject to the conditions before mentioned.

APPARATUS

Other than hives, the necessary paraphernalia for conducting an apiary need not be extensive, but should be the best of its class, as the best is none too good. The number of implements should be limited to actual requirements, as simplicity should be the keynote throughout, avoiding perplexity, complication and unnecessary expense.

HIVES

“What hive shall I adopt?” is a question of considerable importance to the beginner. No beekeeper with any pride in himself or his business would think of adopting any other than a movable-frame hive, of which there are a variety. Several of these are good, but the most popular one at the present day was invented by the Rev. L. L. Langstroth in 1851, to whom the beekeepers of this and all other countries owe a lasting debt of gratitude for the invention that is responsible, in the main, for placing bee culture and honey production on the high plane it occupies to-day.

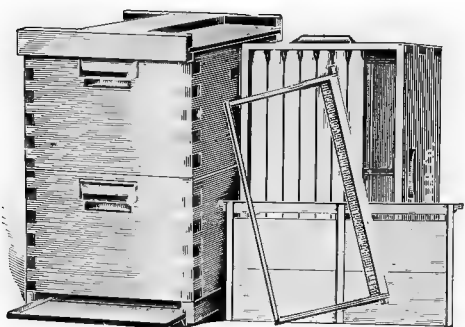


FIG. 39. Standard ten-frame Langstroth hive for extracted honey

The Langstroth hive is standard and may be obtained from nearly all supply dealers at all times, which is a great advantage when the apiarist desires to purchase, rather than build his own hives. By buying in quantities, in the flat, the price is moderate.

This hive is built in two sizes generally, for eight and ten frames. Many beekeepers heretofore have used the eight-frame size for the production of comb honey and the ten-frame size for extracted. Experience has shown that the ten-frame size is the best for an all purpose hive. When run for extracted honey they can be tiered up several stories high if necessary, and will be more stable than a narrower hive, which would need tiering higher to contain the same space. The large size of the brood chamber tends to discourage swarming, when the queen is kept below by an excluder; also more honey is likely to be stored there than in one of smaller size, which necessitates less feeding for winter stores. Mr. James McNeill of Hudson, N. Y., and Mr. R. F. Holtermann of Canada, extensive producers of extracted honey, use and prefer a hive and super holding twelve Langstroth frames.

There are advantages in having the brood chamber and super of the same size as they are then interchangeable and may be used for either purpose. However, for those who consider the full-depth super too heavy to handle conveniently when filled with honey, the half-depth super may be substituted. Some honey producers prefer

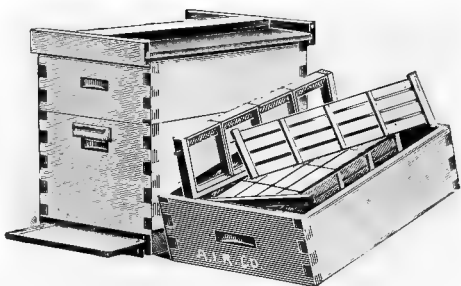


FIG. 40. Standard Langstroth hive for comb honey

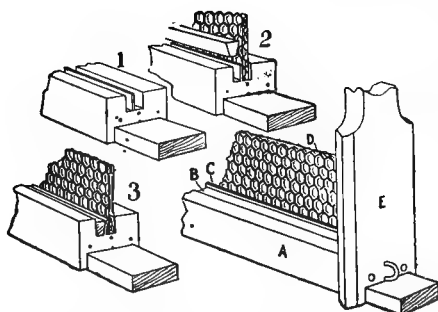


FIG. 41. Hoffman frame, showing method of putting in foundation starters

place of those omitted, especially in the case of newly-hived and shaken swarms. The wide hive gives larger surplus capacity, which is often desirable.

The ten-frame Langstroth hive is $16\frac{1}{4}$ inches wide, 20 inches long outside measure, and full $9\frac{1}{2}$ inches deep. The frames are $9\frac{1}{8}$ inches deep by $17\frac{5}{8}$ inches long. There are several styles of

these — the plain staple-spaced, metal-spaced and Hoffman. For a self-spaced frame, the latter is one of the best and has stood the test of time. The advantages are that they can be handled in groups, are quickly spaced when closing a hive; the hive can be readily carried about the apiary or into the winter repository without especial care, and when the bees are properly confined to the hive, it is ready for hauling or shipment to any distance. A follower should be used at one side of the hive and held tightly against the frames by a wedge or spring.

A plain, simple cover and bottom board is best. The cover should be light and covered with tin or galvanized iron, preferably the former on account of lighter weight; then there should be an under cover of wood three-eighths of an inch thick, cleated,

it, but it is less economical since double the number of supers and frames must be purchased and handled for the same amount of surplus.

In using this size of hive for comb honey production, it is often desirable to contract it, using fewer frames with dummies in

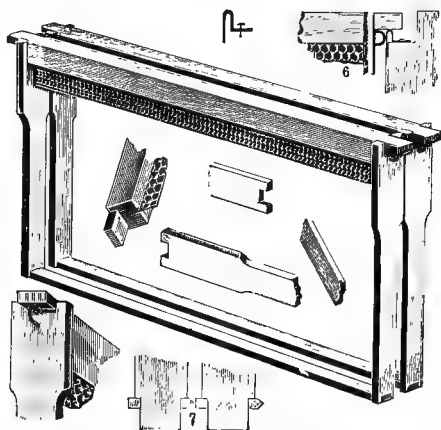


FIG. 42. Detail of Hoffman frame, showing position of beveled edges, and frame resting on metal rabbet in hive.

which may also contain a bee escape, with flap to cover same when not in use. Enameled drilling or duct used with the enameled side next the bees also makes a fine under cover, but is not as durable as wood.

All hives in an apiary should be of the same size, accurately made, of good material, and well painted with some light color for durability and better appearance. Whatever style of hive is adopted by the beginner should be adhered to, as changes in equipment are expensive.

In nailing up hives care must be exercised to place the metal rabbets in proper position. Place the heart side of the boards out to the weather. Nail Hoffman frames with the "V" edge in opposite directions at each end, holding the "V" toward the fingers of the right hand in putting together, and make all frames alike so that they may be reversed, end for end, and be perfectly interchangeable.

QUEEN EXCLUDERS

The queen excluder is constructed in several styles, namely, the

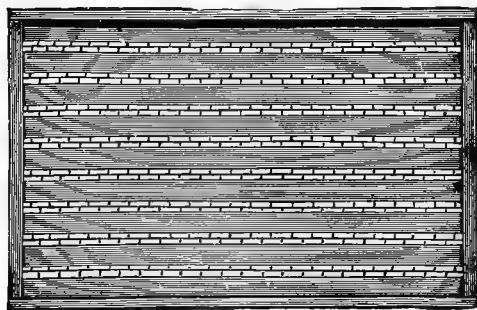


FIG. 43. Queen Excluder

wood and wire with narrow strips of each alternating and built up into a board the size of the hive; the wood-zinc, consisting of strips of wood and perforated zinc built up in the same manner, and sheets of perforated zinc either plain or wood bound, the size of the

hive. In use these full-sized sheets are undesirable as they are too flimsy and frequently become kinked in removing from the hive after being thoroughly propolized.

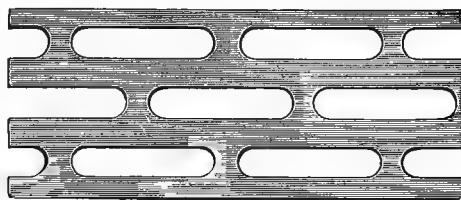


FIG. 44. Queen Excluder Metal

The built-up boards are much more satisfactory and durable. The wires for this purpose are secured at the proper distance apart and the zinc perforated at exactly the right size — about $\frac{5}{32}$ of an inch in width — to keep the queen below, but allow the workers to

pass up into the supers. In the production of extracted honey, the use of these excluders is very essential since all brood is best kept in the brood chamber, and out of the extracting combs where it becomes a nuisance if allowed. Also, less pollen is stored there. Excluders are not needed between the brood chamber and honey supers, unless supers are placed over a swarm before the comb is built in the brood chamber, or the brood nest established.

BEE ESCAPE

The bee escape is a simple little appliance fitted into a board the same size as the hive, placed under the supers of either comb or extracted honey, whichever it is desired to remove from the bees. The bees in the supers pass down into the hive, but none can return. This method is slower than smoking or brushing, requiring from twelve to twenty-four hours or longer, depending on the temperature, to clear the super of bees; however, it is valuable at the close of the season or whenever bees are inclined to rob. It is also popular with beginners and those who are in any way timid in handling bees.



FIG. 45. Bee Escape

SMOKERS

It is folly to attempt the handling of bees extensively without a first-class smoker, numerous kinds of which are on the market.



FIG. 46. Bingham Bee Smoker
(Courtesy of the American Bee Journal)

The essential points are light weight, powerful and cold blast, light and quick action of the bellows, and durability. The Bingham is a good example. Some makes have too wide a spread of the bellows so they cannot be readily grasped by the hand and are thus tiresome to work. In the lowest priced smokers the stove is made of tin. This answers for a time, but if used freely in a large apiary soon rusts out. Copper or brass, preferably the latter, makes a much better implement. The smaller

size will answer better for a small or medium-sized apiary but for

use in a large apiary, the larger sizes are more effectual and require less attention in replenishing fuel. Numerous substances may be used as fuel, among which is rotten wood. This is not all alike, and only that which is thoroughly decayed, fine grained and firm, and contains no hard spots, should be used. It must be dry and is therefore best secured in dry weather. Willow, maple or apple wood are favorites with the writer, but planer shavings — those from hardwood — are more lasting; old burlap sacking, which may be rolled up in suitable size, tied a few inches apart and cut in cartridges with a sharp hatchet is also desirable. Greasy waste may be very effectual, but is so pungent as to be very offensive to some persons, and it seems a pity to desecrate the honey-laden home of the busy bee with such a foul odor, when something else will answer as well, to say the least.

Cotton rags, dipped in a strong solution of salt peter and dried, are very convenient for starting the smoker quickly. Use a little fine, dry, rotten wood or shavings on this until well started; then fill the stove with the regular fuel — thus avoiding the necessity of using hot coals or kerosene oil at the start, as many beekeepers do, which is more inconvenient and increases the fire hazard.

VEILS

In addition to a good smoker, the novice will need protection in the form of a veil. This will inspire confidence and give a sense of security that will permit him to handle bees with a better chance of success. Even the veteran apiarist can often do more and better work in a large apiary by condescending to wear a veil.

Protection for the hands is seldom needed by any



FIG. 47. A good bee veil
(Courtesy of the American Bee Journal)

one, except possibly the beginner. The old adage that "a cat in gloves catches no mice" is applicable here.

HIVE TOOL

Some kind of hive tool is a necessity, and Root's, illustrated herein, is excellent. It is used for prying covers, supers and bottoms loose from the hives, prying frames apart, etc., and the scraper end for cleaning frames, bottom boards and other surfaces of propolis and wax. It is nicely tempered as it is not soft enough to bend nor hard enough to break with ordinary use. It surpasses any other implement for the purpose.



FIG. 48. Root's Hive Tool

FEEDERS

There are several styles of bee feeders on the market, both large and small. The former are used principally for supplying winter stores to colonies which have failed to store in the brood chamber the required amount, which is about thirty pounds. The smaller ones are used for stimulative purposes in the spring, or at any time in the season when a shortage occurs. By using large hives, the brood chambers often contain honey enough to bridge over short periods of scarcity without feeding. The entire apiary should be examined at the close of the season. Experienced apiarists can, by lifting, determine whether a colony is short of stores, and how much will be required to make them safe. Others should weigh the hives and deduct the proper amount for the weight of hives, combs and bees; then bring the amount of stores up to thirty pounds.

In the spring, a sharp watch must be kept on all strong colonies, as such use large quantities of honey for brood rearing and then sometimes starve before getting honey from the fields. If the beekeeper has no honey in combs that he can supply them with, it will pay him well to feed them until the flowers yield a sufficiency.

In the most favorable localities, where there is a fall flow, by proper management, nearly all feeding can be avoided.

WHEELBARROW

In apiaries of any size a light, strong, spring wheelbarrow is a great labor saver. It is very useful in transporting hives and their accessories about the apiary, also supers of comb and extracted honey to the storehouse and extracting room. If the ground is smooth it can even be used to carry colonies to or from the winter repositories, by placing under the hives a thick, soft cushion for a shock absorber.

AUTOMOBILES.

Since automobiles have been greatly reduced in cost, they are becoming quite popular with beekeepers for use in traveling to out-apiaries, taking honey to market in small lots or retailing to private customers. A light auto truck may be used, or a touring car with removable tonneau, or a runabout of suitable design may be fitted with a platform or box on which may be loaded a goodly stock of supplies for the out-apiary, or as much honey as is safe to load on the car in question; but do not overload. Remember that the cost of upkeep is much less on a moderately light car than on a heavy one. On the former, the tires are smaller and therefore much lower priced and the mileage per gallon of gasoline much greater.

The time gained by the use of the automobile versus the horse is an important matter with the busy man, besides the freedom from the care and anxiety which is often experienced when a horse is brought in contact with the bees.

THE COLONY, THE UNIT OF THE APIARY

A normal colony of honey bees (*apis mellifica*) consists of a queen or mother bee, several thousand workers, and during the honey season, some hundreds of drones. Each class has its respective offices and duties, and each is especially important in the

continuity of the colony and race; however, additional importance is attached to the queen through the fact that unless she is young and vigorous, her colony cannot excel in production or profit.

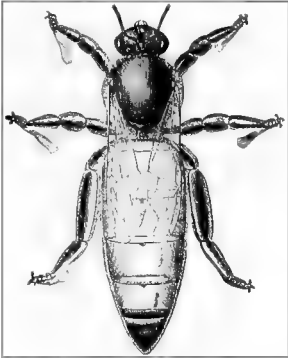


FIG. 49. Queen

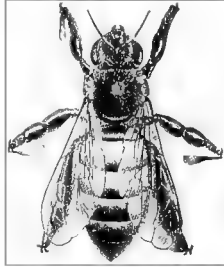


FIG. 50. Worker

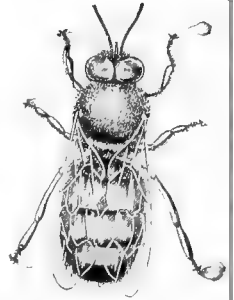


FIG. 51. Drone

THE QUEEN

With a colony in normal condition, the queen, a fully developed female, lays all the eggs for the maintenance and increase of the colony. Under favorable conditions, she has been known to lay 3,000 eggs per day at the height of the season, equalling her own weight, which seems almost incredible to many people.

The production of the apiary, and hence the profits realized, depend largely on the energy of this main spring of the colony. It, therefore, behooves the apiarist to bend every effort to secure this "sine qua non" to the highest success. The honey producer knows there is great variation in the yield of individual colonies, and should the indifferent ones be made as efficient as the best, his profits would be largely increased.

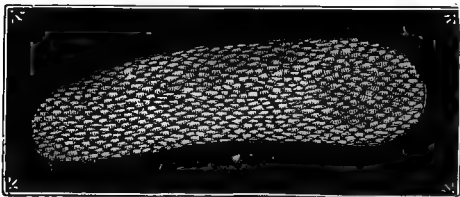


FIG. 52. Egg of a queen bee highly magnified

All queens should be bred from the very best stock obtainable, and mated to an equally good strain of drones. To maintain the requisite vigor and lessen the chances of supersedure, no queen over two years

of age should be kept. They should be replaced by young ones. The natural life of a queen is often four and occasionally five years, but a few hold out in fertility to the end. Others fail and become so-called drone layers, since they lay eggs which produce drones only. Still others are superseded by the workers by constructing queen cells over workers eggs or larvae, the old queen, in some cases, remaining in the hive until a young queen is hatched and laying. In other instances the old queen disappears suddenly, before the workers have made preparations to replace her. Under any of these conditions, the colony is more or less disorganized, and if they take place early in the season, are likely to prove a handicap.

The queen possesses a curved sting which she will use only on a rival.

WORKERS

True to name, the workers are the people of the hive who work, and furnish to their owners and all others a beautiful example of what may be accomplished by diligence and perseverance. They perform all the labor both in and out of the hive. The young build comb and feed the larvae. The older ones forage in the fields, gather the product of the hive and defend it from intruders. They must necessarily be very numerous

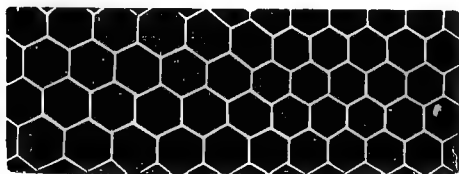


FIG. 53. Drone and Worker Comb, Drone Comb at left

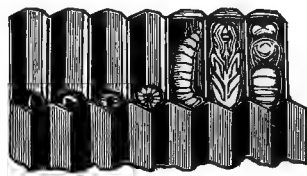


FIG. 54. Brood in different stages of development

to store honey in sufficient quantities for their own needs and afford a goodly surplus for their keeper besides. They are undeveloped females or neuters, and are equipped with a sting which they use freely for defense. When a colony becomes hopelessly queenless, a few of their number, usually called fertile workers, try to become reproducers by laying eggs. These eggs, although usually laid in worker cells, produce only drones, since

being unfertilized they can produce nothing else. Their egg laying is very irregular. Single cells often contain a dozen or more eggs. While the work of the worker bees is in the main remarkable and unapproachable, when they attempt something for which they are not qualified by nature, they make a miserable failure of it.

The difficulty of introducing a laying queen is greatly increased in a colony infested with these obnoxious laying workers.



FIG. 55. Natural built queen cells, the uppermost one having hatched

DRONES

The drones are males. They are the largest bees in the hive and have no sting. They make a great deal of noise and bluster in the world, but their accomplishments are not prominently in evidence. They are typical gentlemen of leisure, enjoying the freedom of the home, living on the fat of the land, taking fre-

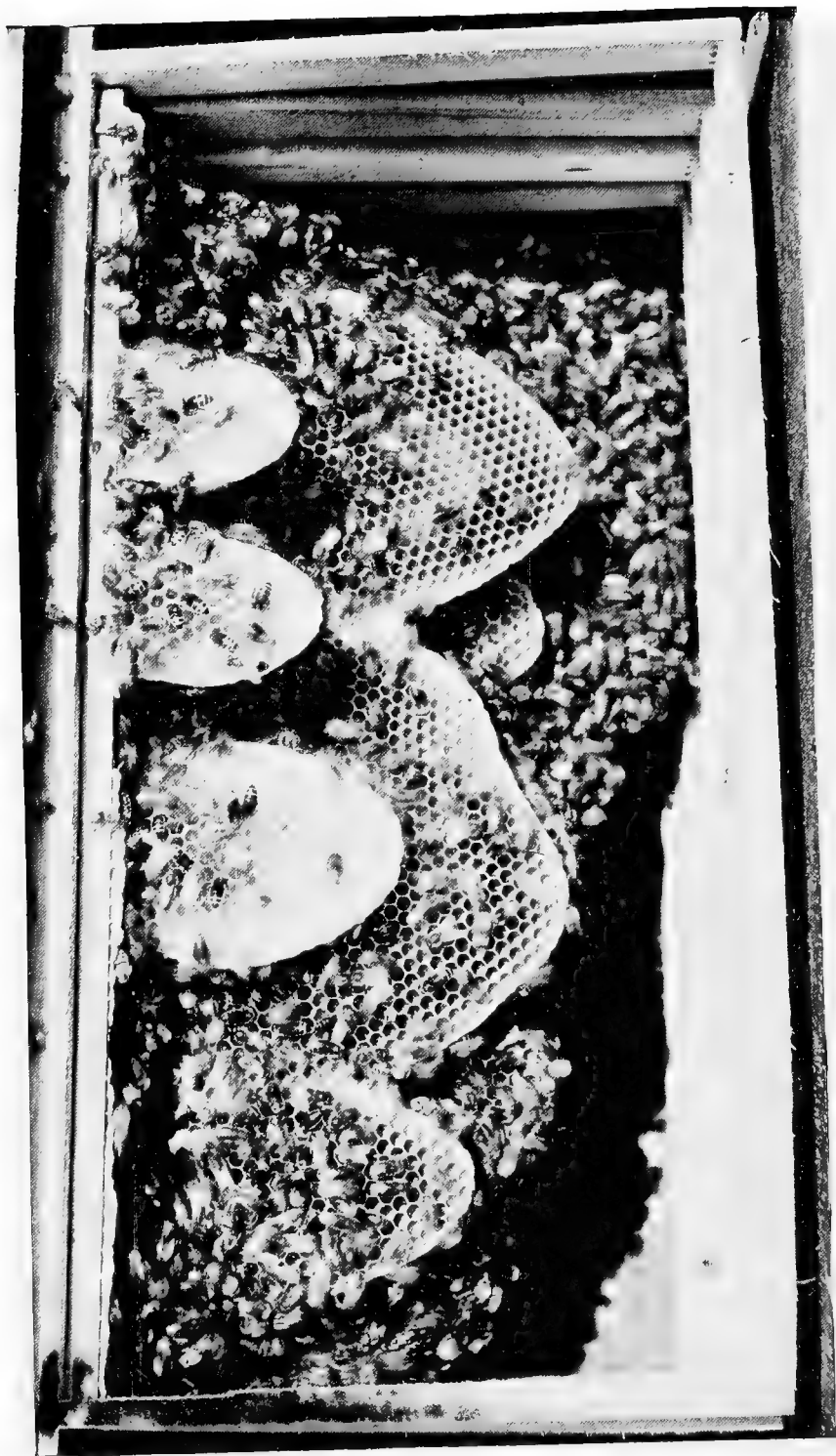


FIG 56. Bees building natural comb

quent aerial excursions and attending all the wedding functions that com. their way.

In the spring of the year when a colony becomes populous from the numerous hatching bees, they commence the raising of drones preparatory to the swarming season. So long as the honey flow lasts, they are not molested, but when a dearth comes at or before the close of the season, the workers slaughter and expel them.

Colonies which have become queenless suffer the drones to remain, even after the advent of cold weather. Their presence in the hive after their general slaughter in other colonies may be taken as an evidence that something is wrong, and such colonies should receive the attention of the apiarist at once.

Except for the improvement of stock, when young queens are being reared, a large number of drones should not be tolerated in the apiary, and an excess of drone comb should be removed from the hives. Twenty square inches per hive is an abundance.

When there is a surplus of drones in the hive, or when they are of undesirable stock, a drone trap may be used at the entrance to catch them in order that they may be destroyed.

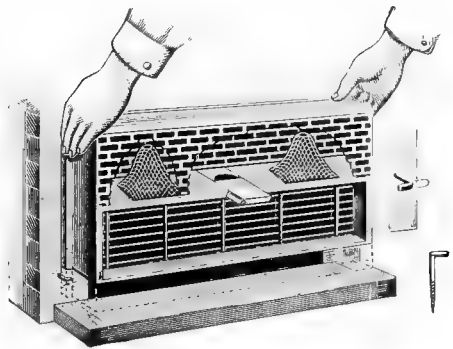


FIG. 57. Drone trap

RACES OF BEES

The black or brown German bee was the original race in this country. The Italian race was imported in 1860, since which time it has been widely disseminated. In later years the Carniolan, Cyprian, Holy land, Egyptian, Caucasian and Banat races were imported and tried out. They were weighed in the balance, and with the exception of the Italians, found wanting.

Many of the good qualities of the Italian race have long been recognized, and it is only a fitting climax that they should be and

are the greatest aid in the suppression of European foul brood. There is no known race that can stand in comparison with them in this respect.

The three banded or tan colored strains are the most desirable and in the imported stock this is the predominating color. The American bred stock frequently runs to bright yellow. No doubt the demand for this stock has had its effect upon many of the queen breeders, but there are a few breeders who have bred up a superior strain of the darker colored bees, realizing that "handsome is that handsome does." These parties are reaping good returns for the labor they have expended in this direction and are frequently unable to supply the demand for their stock.

MANIPULATION

The proper handling of bees is by no means as hazardous or difficult as many people imagine. The principal trouble with beginners is their lack of knowledge of the characteristics and habits of the bee. This creates a fear and uncertainty in their minds. They do not know just what to expect except some stings, nor what to do in an emergency. A little practice and observation in company with an experienced beekeeper would enlighten them greatly.

When it is desired to open a hive for any purpose, start a good fire in the smoker and fill with fuel. Put on a veil if desired,

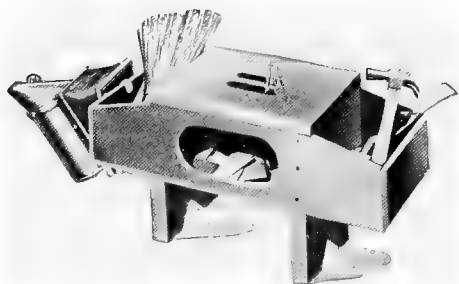


FIG. 58. A convenient tool box

get the hive tool and proceed to the hive in question. Blow a whiff of smoke into the entrance; then insert the hive tool under the cover and loosen it, blowing a little smoke under before any bees can escape. Remove the cover, giving a little more

smoke, after which the bees should be fit to handle. A little smoke may be needed occasionally, but no more should be used

than is actually needed to subdue them. Too much smoke will cause them to stampede and drop off the combs when handling, especially the blacks and hybrids. Occasionally, a colony will need an extra amount of smoke to subdue them. Queens producing such stock should be superseded as it is a nuisance to the beekeeper, if not to others, to have them around, and in some locations would prove a hazard to the business.

When handling bees, the apiarist should be stationed at the side or rear of the hive, so as to disturb the working force of the colony as little as possible.

Occasionally the life of a bee will be sacrificed in manipulating them, but care should be exercised that the number of such be reduced to the minimum.

Careless apiarists frequently kill bees by the hundred, by mashing them between hives, frames, etc., and then wonder why their bees are so cross. Perhaps nothing will arouse the anger of a colony more quickly than crushing some of their number, which besides being cruel is also unprofitable. Other causes of offense are a sudden jar of the hive or combs, quick movements, blowing the breath upon the bees, and the odor of perspiration. It is well to avoid all of these in handling and to work from the side of the hive toward which the wind, if any, is blowing.

Some amateurs handle their bees only in the morning or evening when the weather is comparatively cool, thinking that is the best and only time. Toward the middle of a warm day is a much better time for them to attempt such work, as the bees are in better mood, and many of the old bees,— which by the way, are the ones that object most to being handled — are absent in the fields.

Of course the professional apiarist with extensive apiaries must frequently handle his bees at any and all times of day, in order

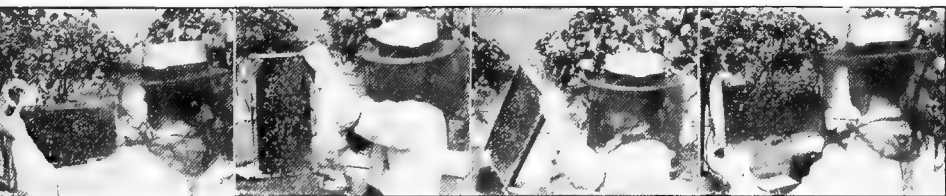


FIG. 59. Handling of frames

to accomplish his work, but his knowledge and experience will carry him safely through, while the novice might easily be worsted.

Some beginners after learning with what ease a colony in a movable frame hive may be handled are loth to give the bees a rest, when in truth they would often accomplish much better results if they were helped less.

INTRODUCING QUEENS

The safe introduction of queen bees is a very important part of the beekeeper's knowledge, especially since the advent of European foul brood and the consequent desirability of changing from the dark races and their hybrids to the Italian race. Besides, it is essential if the apiarist desires to replace queens before their natural failure. Many different methods have been employed with more or less success, a few of which are given herewith.

The strange queen is usually placed in a wire cloth cage when first put in the colony which is to receive her, always making sure that this colony is queenless and without queen cells either complete or in course of construction.

When the queens are purchased from dealers at a distance, they are as a rule put up in cages that may be used for introducing, and directions usually accompany them, by which they may frequently be safely introduced. Others prefer different styles of cages, such as "Miller's" which is thin, light and convenient for placing between combs without spreading, or in the entrance of hives.

A cage introduced by the author has been extensively used for introducing, and although given to the public more than thirty years ago, is still used successfully and practically, according to the original specifications. I quote below from the Beekeepers' Exchange of January 1881:

"Queen Cages and Introducing Queens"

"I notice in the November Exchange that friend J. A. Martin has experienced some difficulty in introducing queens with the 'Peet' cage, by the bees gnawing under the cage and getting at the queen. Some others have reported favorably, but as I have

never used it, I have nothing to say, pro or con. I have, however, used a cage for introducing for three or four years past, which is applied to the surface of the comb in a similar manner. It is made thus,—take a piece of wire cloth of about ten meshes to the inch, four inches square, cut a square inch out of each corner, then bend the projecting parts at right angles to the centre, making a cage two inches square and one inch deep; then ravel out the sides one half inch in depth, leaving the wire projecting that much to press into the comb.

To use this cage, press it into the comb until the wires touch the septum or pass through it a little way, always placing it over some unsealed cells of honey.

I think there is no advantage in having brood inside of the cage, neither would I confine any workers with the queen.

With this cage there is no need of looking up a perfect comb, as it can be placed upon any comb containing honey and it is hardly possible for the bees to knaw into it. The combs may also be placed at the regular distance apart without interference.

When the bees are gathering honey, I usually remove the old queen and immediately replace the new one in the hive, leaving her caged twenty-four hours or so, then remove the comb and drill a hole through the cage, from the opposite side, being careful not to injure the queen. Leave the hole plugged up with broken comb and honey, and the bees will soon liberate the queen while the colony is in a state of quiet.

Whenever it is desirable to cage reserve queens, they may be confined in this way for two or three weeks, without harm.

I have tried a number of different methods and cages for introducing queens, but have as yet found none better than this."

W. D. WRIGHT, *Knowersville, N. Y.*

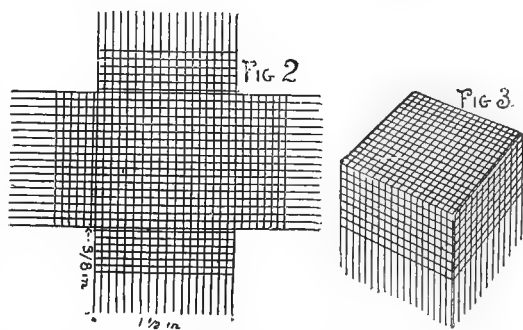


FIG. 60. Wright's Introducing Cage

The above described cage has been slightly enlarged by some; others have recommended that it be placed over hatching brood, but I have failed to discover any improvement by so doing, although this is optional with the operator. By making the cage of the depth recommended the projecting wires will just penetrate the septum and the cage containing the queen will not project above the surface of the comb enough to interfere with the spacing. Cloth woven with rather heavy wires is best, since the projecting wires are not so easily bent out of shape. When not in use, these cages are best kept in shape by meshing the projecting wires of two cages together.



FIG. 61. Queen Cage
(Original)

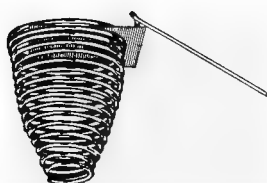


FIG. 62. Queen Cell Cage
(Original)

The "West" cage is also used for introducing queens,* and is found very useful for general use about the apiary for caging queens and queen cells during the swarming season. It is provided with a food chamber which is very convenient and safe.

Queens are best introduced during the honey flow. If it is necessary to introduce them at other times, they may be fed moderately, being careful not to induce robbing which would invite defeat of the object sought.

It is difficult to introduce a queen in a colony which has been queenless for any length of time. Many of such contain fertile or laying workers which complicate matters still more. The following is a very good method of introducing a queen to such a colony: Remove two combs from the centre of the queenless colony; then

See Mr. West's Method, page 1499.

from the nucleus or colony containing the queen you wish to introduce, take out two combs containing bees and hatching brood, and with the queen between them, protected by her own bees, place them in the queenless hive,—close it up and leave undisturbed for a time. I have success with this plan.

At one time I had a particularly stubborn colony which positively refused to accept a queen, but I won finally by removing all of their combs and keeping them combless until they were thoroughly subdued and accepted a queen. For best results, the colony should be queenless but a few days, not more than a week at most.

Mr. C. Russell of Conesville, N. Y., an expert apiarist, has had success in introducing by caging the old queen in the cage to be used for introducing the new one, leaving her there for from twelve to twenty-four hours, then removing her and caging the new one. The object is to give the cage the scent of the old queen.

In any case, if the bees of the colony “ball” the cage—as it is called—by clustering tightly upon it and biting it, the queen must not be liberated until such demonstrations cease. Place the comb back into the hive and examine them a day or two later.

Should a queen be balled by the bees at any time, she may quickly and safely be released by dropping the ball in a pail of water, catching the queen, caging her at once and placing where desired. This works better than smoking the ball as the bees are more likely to sting the queen, particularly if the smoke is hot or even warm.

A very valuable queen may be safely introduced by placing her on two or three combs of hatching brood, placed in a hive and closed bee tight for a few days, until enough bees hatch to care for the queen, when the entrance may be opened. This brood must be kept warm in cool weather.

Queens from a distance may be clipped before introducing them to prevent their loss by flight should they have an opportunity. This may best be done inside of some building at a closed window.

FEEDING

Ordinarily, the less feeding the apiarist has to resort to the better, and in good locations, with an average season and proper manipulation, it may usually be avoided. When comb honey production is followed and the hives used are of good size — say the ten-frame Langstroth — there will usually be sufficient honey stored to carry the bees through the following winter and spring. The amount will be augmented if the bees are of the Italian race, and also if the apiary is located in a good buckwheat raising section or where other honey yielding fall flowers are plentiful. Some colonies frequently contain more honey than is needed; however such can be used to excellent advantage in equalizing with the light-weight hives, either in fall or spring as may be needed.

Where the main crop of surplus is extracted, the case is different, since the brood chamber is not over-crowded with either bees or honey, and the bees often store the bulk of their gatherings in the supers, while the brood chambers are well filled with brood. The close of the honey flow frequently finds the colonies in this condition, and unless the beekeeper wisely reserves full combs of honey for winter stores, it is often necessary to feed largely for this purpose. Some apiarists remove the surplus supers several days before the close of the flow, and thus get considerable of the honey stored in the hives.

When enough honey is not given to make up the deficiency in stores, syrup made from the best granulated cane sugar should be used. This should be composed of two parts sugar to one part water. Have the water hot, and gradually stir in the sugar until dissolved.

This should be fed as rapidly as possible during September or early October so that the bees will not commence brood-rearing. The " Miller " feeder is good for the purpose as it is large enough to contain the full amount to be fed. All colonies should be brought up to thirty pounds in weight of stores.

Some beekeepers use a five or ten pound pail as a feeder, by inverting it in a pie tin after filling and placing it in the super of the hive to be fed.

When it is desired to feed for stimulative purposes, the syrup should be made of one part sugar and one or two parts water, which need not be heated.

There are many styles of feeders used for this purpose, among which are the division board feeders used in the hive in place of one or two frames. The "Alexander" feeder fitted in the bottom board under the rear end of the hive, the "Stahlman" feeder used under cover at top of hive, inverted fruit jars, tin cans, etc.

Any waste or refuse honey which is known to be free from disease germs may be fed when the bees can fly frequently. This should be diluted by adding an equal amount of water.

Some experienced apiarists succeed well in feeding in the open air for stimulation or during shortage of honey. Some special arrangement which the bees may visit in large numbers without danger of drowning, should be provided for this purpose. They should be fed a moderate quantity each day that they are able to fly, until they can obtain a sufficiency from the fields.

The indiscriminate purchase of honey for feeding is prohibitive on account of the danger of introducing disease into the apiary.

Whatever method of feeding may be employed, it is highly essential that the robbing propensity of the bees be forestalled.

COMB FOUNDATION

Comb foundation is a modern invention of no inconsiderable importance and has become a necessity in commercial beekeeping. It is made from pure beeswax by melting and sheeting same, then embossing the sheets to imitate the septum of the natural honey comb. The size of the cell outline is also identical with that of the natural worker comb as built by the bees. This is the only size that is profitable for general use. The annual output of this product by the various manufacturers amounts to hundreds of tons.

One pound of wax as produced by the bees, requires the consumption from fifteen to twenty pounds of honey, besides much time used in construction, hence it is obvious that by furnishing them with a large proportion of this wax ready to work, much time and honey is saved.

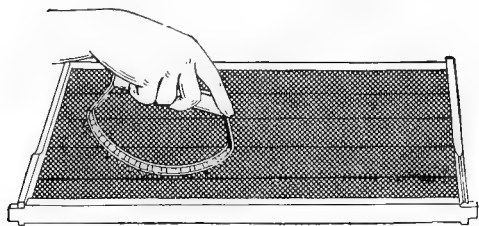


FIG. 63. Fastening foundation in wired frames

worker combs, are straighter, and by incorporating fine wire into the foundation before it is drawn out, the resultant combs are much stronger and tougher than natural ones, which is a desirable requisite for rapid handling, extracting, etc.

The saving of time and the perfect workmanship of the finished product also applies to its use in the sections used for the production of comb honey. Since the cells are all of the workers size, the surface of the capping presents a smoother and whiter appearance if full-sized sheets are used, than when natural comb is built or only starters of foundation used, in which case many of the sections will contain more or less comb of the drone size, in which a portion of the honey touches the cappings which detracts much from its salability. The artificiality of this product disappears, inasmuch as the bee herself caps the climax.

SWARMING

The natural swarming or increase of the honey bee is one of the most interesting and wonderful features of its culture to the student of nature. It also may become one of the most demoralizing and exasperating of conditions to the extensive apiarist who has failed to exercise the necessary precaution early in the season to avoid or ameliorate the conditions that naturally obtain when his colonies become populous.

With a moderate natural increase early in the season, and a long honey flow, the amount of surplus may not be materially lessened, but at the best, there is sure to be a waste of time in caring for the swarms as they issue. As is the case in some seasons, if swarming is excessive, a large yield of surplus cannot be expected.

When natural swarming is allowed, all queens should be clipped. That is, one-half or more of one or both wings should be cut off with a sharp penknife or scissors; and it is safe and best to practice this in any event, since it gives better control of the queens when they occasionally get into the air. Care must be exercised in clipping not to pinch or injure the queen in any way, and especially to avoid cutting off any of her legs, which would prove a handicap in the performance of her labors.

When a colony becomes populous in the spring, the bees commence rearing drones; later as the hive becomes crowded with bees and brood and honey is being gathered, unless preventive measures are adopted queen cells are started, and eight days later when the first cells are sealed, the prime swarm issues with the old queen, often a few drones, and the major portion of the working force of the colony. This is the rule, but as there are exceptions to all rules this one is not invariable. Inclement weather or a cessation of the honey flow may postpone the issuing of the swarm for several days and occasionally the queen cells may be destroyed and no swarm issue.

If the old colony is left undisturbed after swarming, a second swarm frequently issues, usually on the ninth day after the prime swarm and soon after the young queens hatch, one or more of which accompany the swarm.

By applying the ear to the hive on the evening or morning before the after swarms issue, the queen may be heard piping; sometimes several may be heard at once, giving different tones, some high and fine, others low and coarse. This is a pretty sure indication of swarming where there are young queens in the hive.

It is usually poor policy to allow after swarms to issue and they should be prevented by removing all queen cells except one of the largest and most mature, six or seven days after the prime swarm issues. It is also a good plan to place the prime swarm on the stand of the parent colony, moving that to a new position wherever desired. This strengthens the working force of the swarm and tends to discourage after swarming in the old colony.

Nearly always, swarms accompanied by a queen, cluster in the vicinity of an apiary on trees, shrubs or some other object, where

they remain for a longer or shorter period before leaving for a home in the woods. During this interim the bees must be hived. When the queen is clipped, she may be caged and placed with the swarm, or the old hive may be removed to a new stand, the new hive placed upon the old stand. Allow the swarm to return to that position, placing the caged queen with them and liberating her after a short time. Sometimes returning swarms will enter neighboring hives, when they should be covered with sheets to exclude them. New swarms are often loth to enter a hive filled with foundation in the middle of the day when the weather is warm, and will frequently leave it after hiving. I much prefer to hive swarms temporarily, as they issue, in empty boxes of suitable size, keeping them well shaded and ventilated until evening; then hiving them on foundation. By doing this they will usually be nicely settled before morning. Swarms may be disposed of much more rapidly in this way, with less danger of mixing up, in large apiaries.

If swarms are not desired, the hives should be well ventilated, have large entrances, more or less shade and plenty of room for storing honey and rearing brood.

ARTIFICIAL INCREASE

Some apiarists maintain that natural swarms are best, that they work with an cagerness surpassing all artificially made increase. However, with proper management and manipulation, the latter have proved to be the equal of the former in production, besides giving several distinct advantages. If the apiarist has his colonies in proper condition, he can make his increase at the beginning of the honey flow or at any time he may desire, and do it rapidly: Whereas, if he depends on natural swarming, he must spend the best part of every fair day in the apiary watching and waiting for swarms during the swarming season, which often continues from four to six weeks.

The forced swarms should be made at the commencement of the swarming season, so as to forestall swarming in the main and speedily get all colonies in condition for the honey harvest. After division, if given sufficient room for storage and proper ventilation, there is but little danger of their swarming.

Various methods of making increase have been given from time to time, but one of the best and approaching natural conditions is the following: Prepare the new hive, preferably filled with frames of wired foundation, take it to some strong colony which is to be removed from its stand and the new hive set in its place. Now remove the combs of the strong colony, keeping a watch for the queen, and shake most of the bees into or in front of the new hive until you have about two-thirds of the bees of the colony — say, five out of eight combs or six from a ten frame hive — and the queen. Replace all combs in the old hive, remove it to a new stand wherever desired and give a ripe queen cell or a laying queen after a day or two. The best time of day to operate is toward evening, as some artificial swarms, as well as natural ones, become discontented and desert their hives, but when hived at evening they usually become settled before morning. If desired, a frame of brood from the old colony may be left in the new hive to hold the bees down, replacing it with a frame of foundation.

The entrance of the old hive should be contracted for a time, as most of the old bees will join the shaken swarm.

Do not divide a colony that is not fit to swarm naturally. Many beginners who are anxious for increase, divide their colonies to such an extent that they have only a quantity of nuclei, unfit for either storing surplus or wintering.

PRODUCTS OF THE HONEY BEE

The following substances are gathered by the bees, namely: honey, pollen, propolis and honey-dew. By the consumption of more or less honey by the worker bees, beeswax is secreted and built into comb to contain honey and brood.

Honey

The correct definition of honey is this: “Honey is the nectar and saccharine exudations of plants, gathered, modified and stored in the comb of honey bees.” Any substance to which this definition will not apply can not be legally labeled and sold as honey.

Honey is marketed in two forms — comb honey and extracted honey. The former name is applied to the product sold in the

comb and usually in small sections, and the latter to all honeys separated from the comb, either in liquid or granulated form.

As the principal income from the apiary is through the honey produced, it is of vital importance to the apiarist that he should produce the maximum amount, and that of the highest quality obtainable. By quality is meant the ripeness and richness of the extracted product and the most perfectly filled and whitest capped in comb honey. With the latter this requires especial care and attention at just the proper time.

Pollen

Pollen is the fertilizing dust of flowers, which is gathered by the bees and packed in solid lumps on their posterior legs for transportation to the hives. On their arrival home, they insert these legs into an empty cell or one partially filled with pollen and dislodge the lumps with their other legs and again return to work, leaving the pollen in the cell to be kucaded down flat by other and younger bees. The cells containing pollen are never entirely filled with this substance, but are frequently filled up with honey and sealed over. Pollen is usually stored in worker comb, and in queenless colonies the breeding space is often badly clogged with it. It is of many colors, depending on its source, ranging from cream to dark purple. Some flowers yield a large amount with but little honey and vice versa.

Pollen is used by the bees for the preparation of food for the larvae, and little or no brood can be reared without it or some substitute for it.

Propolis

This sticky substance is gathered from the buds of trees and shrubs, and is used by the bees for cementing the crevices and covering up rough places in the hive. In sections where it is plentiful, they frequently use large quantities of it, and daub it over the inside of the hives and sections quite freely. In such cases it proves to be a nuisance, since it interferes with the handling of frames, and largely increases the labor of preparing comb honey for market. Where propolis is somewhat scarce, the bees often mix wax with it, and occasionally use pure wax as a cement; especially is this the case early in the season. Late in the season the

hands often become soiled with this gum which is somewhat difficult to remove, but by using oil or grease, then soap, it is made easier. Lava soap used alone is very effective.

Honey-dew

This substance is secreted and discharged by the aphids, or plant louse. It is occasionally gathered freely by the bees, and if stored in their hives in any quantity for winter food, is a sure harbinger of trouble for the apiarist. If possible it should be extracted from the combs and good honey or sugar syrup fed for winter stores. Where bees are long confined with much honey-dew for food, the mortality is unusually great. This stuff is unfit for sale, and is only useful to feed bees in warm weather when they may have frequent flights. It is usually of a dark color and rank flavor.

Beeswax

Although the production of beeswax in this country is somewhat limited, it is still a very important product of the honey bee. For many years it has been prominent as an article of commerce and is always in demand, the price fluctuating slightly at different seasons of the year.

There are mineral and vegetable waxes known to commerce: Each have their uses, but their values are much lower, as they are for many purposes much less efficient and effective than beeswax. For certain purposes no other substance can compare with it.

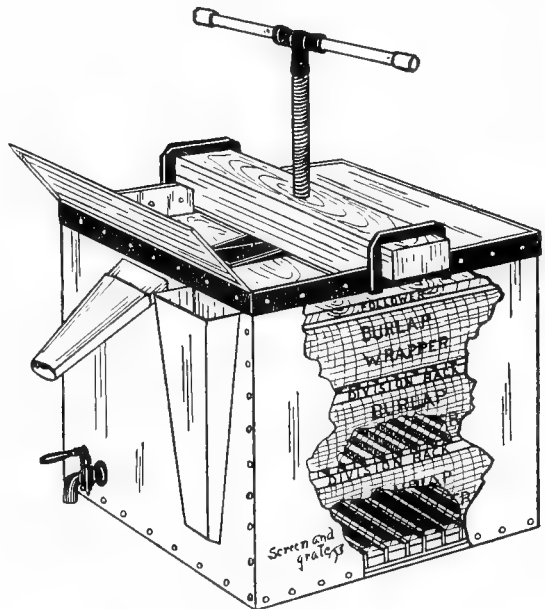


FIG. 64. Hershiser wax press

Large quantities of beeswax are consumed in the manufacture of wax candles, in the dental profession and in other arts and crafts.

Beekeepers themselves are becoming extensive users of this product, and it appears reasonable to expect an advance in price with the coming years on account of the increasing demand.

Beeswax is produced at much expense to the apiarist as it is a well-known fact that the bees consume from ten to twenty pounds of honey to secrete one pound of wax.

The waxen combs of the bee are indeed a wonder. With its God-implemented instinct and without square, level or compass, the bee produces a work that is nearly perfect for the purpose required; namely, for the storage of honey and rearing of brood, for the maintenance of the colony.

The apiarist should carefully gather all fragments of comb and wax that are removed from hives, frames, etc., in apiary work. These may be melted in a solar wax extractor or otherwise. In rendering old combs into wax, if done in quantity, it will probably pay to secure a good wax press, as that is about the only way in which practically all the wax may be secured.

SHALL THE BEEKEEPER PRODUCE COMB OR EXTRACTED HONEY?

This question must be decided by each individual for himself, depending as it does on the circumstances of the case.

Some sections are better adapted to the production of comb honey than others, especially where there is a long, continued flow of clover or other white honey. Again the apiarist, if following the occupation for recreation, may prefer this for æsthetic reasons since more time and skill is required to produce it, and the result is more artistic and beautiful.

It has been frequently claimed that comb honey is a luxury — hence the demand is somewhat limited, and consequently the price can not be advanced to any extent. If such be the case, let it take its place beside other luxuries and make the price such that it may be produced at a good profit. The people who purchase luxuries *will* have them and pay the price whatever it may be.

Extracted honey while just as healthful and good as an article of food, can be produced and sold more cheaply and will be pur-

chased by the masses in preference to comb honey in many cases, especially where the latter is considered too high priced.

One cause for the exodus of beekeepers from the comb honey producing ranks is the lack of proper remuneration for the time, labor and expense involved in the production and marketing of this article. An annual outlay for sections, comb foundation, shipping cases, carriers, etc., is required, also extra time and labor in preparing the same for use, and preparing the crop for market. The extra cost for freight rates and risk of breakage in transit all figure against the low prices of the past on comb honey.

On the other hand, in producing the extracted article a greater yield can usually be obtained; in some cases, and under certain conditions, probably double the amount. The amount of labor and expense is reduced; the cost of containers or packages is less, and same may be shipped with comparative safety. Also, the crop is ready for market when harvested. An apiary run solely for extracted honey is more easily controlled, and the difference in the price of these commodities being at present comparatively small, the apiarist will be able to determine which product most appeals to him.

COMB HONEY PRODUCTION

The successful production of comb-honey requires much more skill and labor than the production of an equal amount of extracted honey, therefore it behooves the apiarist who desires to secure the former to adopt only the most effectual methods and approved devices.

The hive should not be too deep, else there will be too much honey stored between the brood and supers. It must afford a large surface above the frames giving a surplus capacity of thirty-five to forty pounds in a single tier.

In a good season, a strong colony would fill a forty-pound super as quickly as one of twenty or twenty-five pounds' capacity, making a difference of twenty-five to forty per cent. in yield on this item alone.

Some apiarists have been successful in using twin supers, that is two abreast, but I prefer a single super as being more simple

and quicker to handle. They should admit of tiering up when desired, with free communication between same.

A pound-section, so-called, is most desirable, preferably four by five inches in dimension, this shape being handsomer in appearance and more readily salable than a square one. The Danzenbaker section, I consider O. K., and when used plain, in connection with the fence separator, makes a neat outfit; however, I use and prefer a slotted separator and bee-way sections. The plain separator is less expensive, more durable and easier to clean. These are one-eighth inch thick and dressed on both sides. I nail a separator in one end of the super and another one on the follower, thus giving a passage-way from the hive to the outside of the end sections, which facilitates the finishing of them.

I would recommend using full sheets of thin super foundation in all sections, thereby increasing the yield greatly, besides getting straighter and smoother combs. Leave one-fourth of an inch space at bottom of foundation in a section five inches in height to give room for sagging and to prevent buckling. Some apiarists recommend using extra thin super foundation, but as it is liable to sag in hot weather, and is sometimes torn down by the bees during a scarcity of honey, I prefer the "thin" only. I have received no complaint in regard to what is usually called "fish-bone" in comb honey, caused by the use of foundation with heavy septum.

Bottom starters may possess some advantages, but I have never felt the need of them, consequently have never used them. They certainly require more labor and I have endeavored to secure the maximum quantity of surplus of good quality with the least expenditure of time and money.

Examine all colonies early in the season, to ascertain if they have good prolific queens, and plenty of honey to foster brood-rearing. Then they will increase their brood as fast as they can care for it. The apiarist who gets anxious to assist bees in this process and spreads the frames of brood, often finds it a delusion and a snare.

The apiarist must decide whether he will allow a moderate increase before the principal honey flow, or prevent it altogether, and turn the entire working force into the supers.

At the commencement of the honey flow, place supers on all colonies that are in a suitable condition and continue with the others as fast as they come into condition. If the colonies are populous, with honey flow, and weather conditions right, place an empty super under the first when the bees commence sealing in the same. Follow this plan up as long as advisable, but do not carry it too far, so as to have a lot of unfinished sections at the close of the season.

The last supers given toward the close of the flow, or when the bees are working moderately, should be placed above those nearly filled, and dropped to the hive when the latter are removed.

Remove the surplus as soon as the combs are sealed, to preserve the whiteness of the cappings.

Store the surplus in a dry and warm building until ready for market. Clean the sections of all propolis, grade it nicely and pack it in clean crates.

THE PRODUCTION OF EXTRACTED HONEY

When the colonies become populous and the honey flow is near, and before preparation has been made for swarming, supers containing empty comb or foundation should be placed on them with a queen excluder intervening. When these supers are two-thirds filled, another may be added — and so on to the end of the flow. This will tend to discourage swarming and the honey will be well ripened by remaining on the hive. Where the crop is secured from different sources and is of varying colors or grades which it is not desirable to mix, the supers should be removed and honey extracted and then replaced for the next flow. This is especially applicable to buckwheat growing regions.

Extracted honey may be and is frequently produced with but one super to each colony; however, it is then sometimes necessary in a flush yield to remove the honey before fully ripe, and ripen artificially in tanks or other receptacles, which is not always satisfactory. Besides, the extracting must be done more frequently and the colonies are much more apt to become overcrowded without close attention.



FIG. 65. The proper manner of brushing bees from comb with the German bee brush



FIG. 66. Manner of using the Coggs hall bee brush

All hives should be well ventilated, and should have large entrance room. In removing the combs for extracting, the quickest method is to take them from the supers and shake the bulk of the bees at the entrance and brush the balance off quickly with a Coggshall or German bee brush as shown in the accompanying illustrations. Place them in another super on a wheelbarrow or other vehicle and cover up bee-tight if there is any danger of robbing. Do not

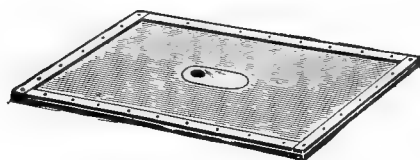


FIG. 67. Board containing
bee escape

continue this work too long at a time when robber bees bother. At such times the supers may be removed to good advantage with bee escape boards. At times

much of the work may be done during early morning or late evening to evade robbers. As soon as a load is obtained, hurry it into the extracting room or other safe place.

Secure a good, modern, reversible honey extractor to remove the honey from the combs, and if to be done in an extensive way, it will pay to get a four, six or eight-frame, power-driven extractor. This outfit will keep two hands uncapping while one does the extracting. For uncapping the combs, nothing surpasses Root's steam uncapping knife. When properly manipulated this is always in condition for slicing off cappings, and a capping melter may be used to uncap in if desired. A very good and cheap method of disposing of the cappings is by using a sugar or cracker barrel with holes bored in the bottom, and secured in a wash tub to catch the dripping honey, as recommended by the late W. Z. Hutchinson. When most of the combs are sealed, a nice lot of wax may be obtained from the cappings. The combs in the supers should be spread somewhat, using eight or nine in a ten-frame body so that the combs may remain of the usual thickness after they are uncapped.

The honey may be drawn from the extractor in pails and emptied through suitable strainers into tanks, or where convenient, carried by gravity, or pumped by a rotary pump driven by the

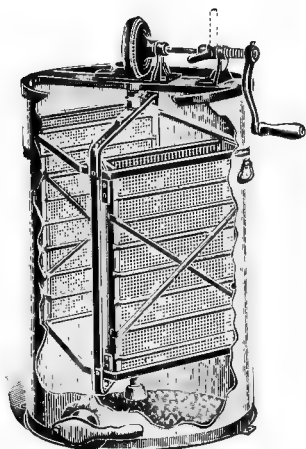


FIG. 68. Cowan reversible extractor



FIG. 69. Root's steam uncapping knife



FIG. 70. Bingham improved uncapping knife

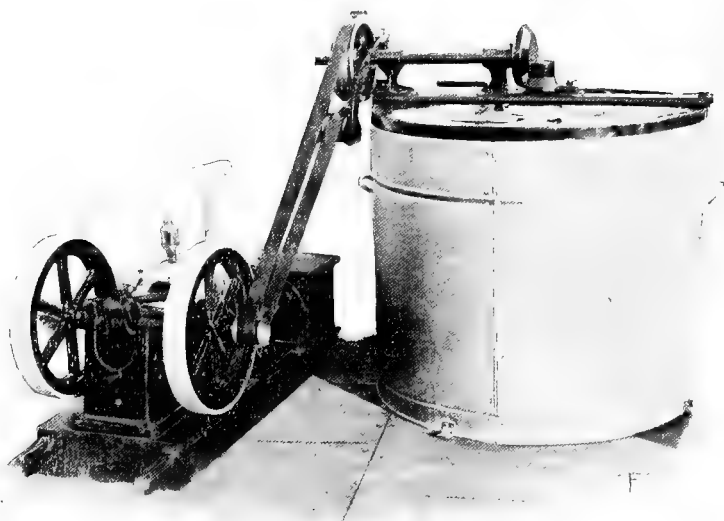


FIG. 71. Root's reversible power honey extractor

engine. It should be allowed to stand and settle a short time in the tanks, when it may be skimmed and drawn off through a gate into tin cans or wooden kegs. It is very convenient to have these vessels stand on a scale with an electric bell attachment to warn when filled.

Some extensive producers having out-apiaries are provided with an extracting outfit at each apiary; others bring the supers to the home apiary to extract, and still others transport the outfit from place to place.

MARKETING HONEY

Honey is usually marketed during the fall months; probably the bulk of it in September and October. If a large quantity is put on the market early in the season it may give a false impression as regards the size of the crop, and possibly depress prices.



FIG. 72. Comb honey in shipping case

All packages for comb honey should be clean and neat and all propolis and stains well cleaned from the sections. These should be packed in nice cases holding twelve or twenty-four sections each, with one glass side. Mark the net weight on each case and when to be shipped some distance, place six to nine cases in a special carrier well packed in straw or similar substance at

bottom to form a cushion or shock absorber. These carriers are provided with projecting handles for safety in handling.

It is well to place a warning notice on each carrier, showing the proper position of same in relation to the locomotive of train, bow of boat, etc.

It is essential that the honey be carefully graded and uniform throughout the case if the best price is to be obtained and the producers' reputation for integrity maintained.

The marketing of the extracted product is a much more simple matter. The principal point is to have a first class article well-ripened and of good flavor.

In many localities honey producers have established a fine retail trade in their own neighborhood and disposed of a part or all of their crops at good prices, and there is no doubt that many another beekeeper could do likewise by making the proper effort; thus not only finding ready sale for their product and increasing their income by the advance over wholesale prices, but also extending the use and increasing the consumption of this healthful sweet.

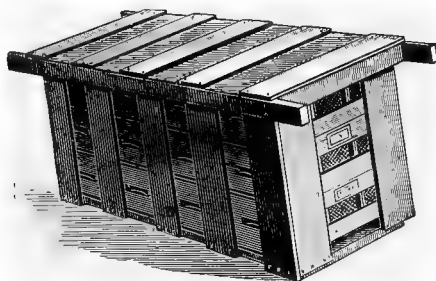


FIG. 73. Comb honey cases packed in carrier for shipment

THE WINTERING OF BEES

In this northern climate the safe wintering of bees is an important problem and a topic of interest to every honey producer.

Some apiarists of this state winter their bees successfully on their summer stands, but probably a large majority believe in the protection of some indoor repository, mainly cellars. Cellars used for this purpose should be moderately warm with no danger of freezing. The temperature may be kept at from forty to fifty degrees, and sufficient ventilation should be provided to keep the

air fresh at all times. A warm cellar in which a large number of colonies are stored, might have a window left open all winter by packing same properly so as to exclude light. The hives should also be ventilated more or less, depending on the temperature of the repository. The bees should be kept in the dark and quiet; the hives supported from the ground or bottom only, having no connection with upper floors, to avoid the transmission of jars. A boiler or furnace in a cellar where bees are wintered is not objectionable; in fact it may often prove to be advantageous by improving ventilation and furnishing additional warmth.

Where a good cellar is not available for the purpose, one may be constructed cheaply in a bank or practically above ground by setting up posts and using timbers or poles for a frame work, covering these with cheap lumber, then banking well with earth to the plates and covering over the top with sawdust one or two feet deep, with a cheap roof over all. Such a cellar will meet the required needs as well as the most expensive one.

In this latitude the bees should be housed in November and replaced upon summer stands in March or April, depending on the weather conditions. A bright, warm day should be chosen for this purpose as it is very essential that their first flight be successfully accomplished, since their future welfare depends much upon it. It has been recommended to place hives on the same stands that they occupied the season before, but this is unimportant.

Be sure that rats and mice are excluded from the cellar, also from hives wintered out, as they would cause havoc among the bees and comb.

When bees are wintered out-of-doors they should be in a sheltered location and protected by a packing of leaves or straw at back and sides of hive—the front may be exposed if facing south. Cover the packing to keep out wet. Of course if they are in double or winter hives, this precaution is unnecessary.

If well wintered there is little danger of spring dwindling. The tops of the hives may be made tight to retain the natural heat of the colony, and the entrance reduced to actual necessity for the size of the colony. See that they contain plenty of stores for the bees and brood and handle them but little until settled warm weather.

ENEMIES OF BEES

The Wax Moth

In reality, this is more an enemy of the beekeeper than of the bees, since by keeping all colonies strong, especially if they be of the Italian race, but little damage can be done them by this pest. The trouble comes, however, by the moths hatching in the combs when unprotected by bees, and in hot weather they multiply very rapidly. The apiarist who has a stock of combs on hand, probably stored away where he considers them perfectly safe, had better watch them closely. If these combs have been exposed to a freezing temperature for some time and moths or bees have not had access to them since, the probability is that they will remain free as long as thus protected.

After moths have commenced hatching in combs they may be destroyed by fumigating with sulphur, by piling hives containing them in a small room and filling the room with the fumes. The hives should be set upon something to keep them above the floor, and at least partially opened below the bottom.

When these empty combs are not too numerous they may be protected by hanging them up in the open and placing them an inch or two apart.

There is much value in a stock of good empty worker combs, but they should be utilized as soon as practicable, as they are never safer than when covered with bees.

The above refers to the greater wax moth, the larva of which is often an inch in length and easily recognized.

There is also another variety that frequently infests the combs of the honey bee; namely, the lesser wax moth. However, the ravages of this variety are seldom very serious, and may be treated in the same manner.

Rats and Mice

Where these vermin have access to bees, honey or combs, they cause serious havoc, and a vigorous warfare should be maintained against them. They are a perfect nuisance, and frequently cause so much disturbance to bees in winter repositories that they cause a greater consumption of honey by the bees, and in general interfere with their successful wintering. There is little excuse for their presence, since by proper effort they may be eradicated.

Skunks

In some sections these animals are quite numerous and when this occurs in the vicinity of an apiary, they usually pay visits to it. Their method of procedure is to disturb the bees by pawing or scratching on the hive and alighting board, which brings the bees out to investigate, when they are promptly devoured by Mr. Skunk. A remedy is to place poison into an egg and leave in the apiary at night; or they may be trapped or shot.

DISEASES OF BEES

EUROPEAN FOUL BROOD

Prevalence

The prevailing bee disease in this state is supposed to have originated in Schoharie County, about the year 1895, and spread with such rapidity as to cause fearful havoc among the bees of that county, completely destroying many large apiaries. The infection has also extended to adjoining counties. It has been controlled and in some cases suppressed in these counties, but it now appears from time to time in several parts of the state. The combined energy and perseverance of the inspectors and of all beekeepers in the infected districts will be necessary to abate this scourge.

Cause

The disease is caused by the presence of a specific germ known at present as *Bacillus pluton*, according to the best authority, which is present in this disease, and which develops in the larva, usually resulting in death in the larva stage.

Appearance

The healthy larva are of a pearly whiteness and lie curled around the bottom of the cells, but when attacked with this disease they change to a yellowish tint and occasionally show a small black dot on the upper side; dying, they settle down to the lower side of the cells and continue to grow darker in color until brown or black, emitting a sickening odor.

The Bacillus and Its Spores

Later in the life history of the bacilli, spores are produced. These form the resting stage of the bacilli and may be compared to the seed of higher plants that are ready to germinate as soon as they are placed in suitable ground. These spores are innumerable and cover to a greater or less extent the combs, frames and every portion of the inside of the hive, including honey and pollen; therefore, if any honey, comb, etc., from diseased colonies come in contact with same in healthy colonies, they would probably contract the disease. There is also great danger of contamination through robbing.

Caution

It is hoped that beekeepers will realize the necessity of exercising great care in dealing with this disease. It should be as vigorously treated as a case of smallpox or yellow fever in your own family, and it requires as thorough disinfection. Carelessness or negligence in handling or treating will be sure to cause the spread of the disease in your own and neighboring apiaries. Do not tolerate any weak colonies in your own apiary, as they are liable to be robbed out when honey is scarce in the fields. If they are diseased, the best and safest way will be to kill the few bees remaining, at evening, by brimstoning and afterward burning the combs, frames, quilts, bees, etc. Dispose of all honey, combs, brood, etc., immediately after treating diseased colonies, or any that may have died, as you are never safe with any of these standing around. "Delays are dangerous," especially so in this case.

Always disinfect the hands, tools, etc., after handling infected colonies, by washing in a solution of carbolic acid, using one tablespoonful of pure acid, either liquid or crystals, to one quart of water; or a five per cent solution of formalin is possibly better.

Management

This disease is more pronounced early in the season when the bees are breeding heavily, than later, when it frequently abates to some extent. The removal of the queen from a diseased colony is always a check to the disease and can often be used to advantage in handling it.

Always treat the disease at evening or about sundown, seeing that no stray bees enter healthy colonies. If you have good hives they may be saved and used again, but in no case try to save any of the contents unless there is much honey or wax, which can be saved by cutting out and boiling thoroughly for one hour. It will be well to add a little water to the honey to prevent burning. Do all handling of honey, etc., under cover, where no bees can gain access to it. Do not buy any honey for feeding, as there is great danger of getting that which is infected; the sugar feed is safest.

Do not exchange combs or supers from hive to hive in apiaries affected with the disease.

Prompt Action Essential

It is expected that you will treat promptly all stocks marked by the inspector as diseased, and any others which may show the disease later on, that he may not be compelled to resort to more stringent measures.

Treatment

Good results have been attained in the past by treatments here given, and many badly diseased apiaries cured, and the owners have a feeling of security and satisfaction heretofore not enjoyed by them. *The Italian race of bees is regarded more nearly immune than other races from this disease*, and it is recommended that all apiaries in or dangerously near diseased territory be Italianized.

The best time to affect a cure is during a honey flow at any time after the commencement of white clover bloom.

If stocks are weak to medium, unite a sufficient number to make them as strong as a good prime swarm.

In any treatment, when confinement of the bees is prescribed, they may be placed in cheap, light boxes of sufficient size, say a bushel or more, or, if preferred, in the old hives before disinfection. Be sure that they are bee tight. Cover one of the largest sides with wire cloth. In re-hiving place them in new, clean or disinfected hives.

In any of the several treatments herein given, the use of foundation starters in the primary treatment is optional. When re-hiving the bees they may, if preferred, be placed upon starters instead of full sheets of foundation.

In rendering wax from diseased colonies never use a sun extractor, but subject to heat for one hour or more over the stove.

Some recommend as quite important the introduction of a new queen at the time the bees are removed from the old comb, caging the queen for several days. Be sure that she is reared in a healthy colony, away from all infection, and she should be of the Italian race.

Treatment Number One

Shake off or drum out all the bees of the diseased colony, place them in empty hives on the old stand for three or four days, then re-hive them in new or disinfected old hives.

It is well and perhaps best to use frames containing foundation starters at the first, and full sheets at the last shaking, melting up the starters by boiling into wax. The old hive may be used without disinfection if desired, at the first shaking. In treating colonies it is always safest to shade them for several days, from the direct rays of the sun, and to ventilate them well, as the bees will be less inclined to abscond. If desired, a queen excluder may be placed on the hive to retain the queen. It is also well to have the queens clipped.

Fair success has been obtained by shaking but once, but should the disease reappear it will be necessary to repeat the operation.

When diseased colonies have a large amount of brood at time of treatment, it may be placed together in a hive after the bees are shaken off, and set over a weaker diseased colony, or several hives of this brood may be tiered up over one colony and shaken later, when the brood has mainly hatched—say in two weeks. Care must be taken, however, that no robbing from these combs occurs. Also, contract the entrance well.

Treatment Number Two

Colonies that are found to be diseased too late in the season to treat by the aforesaid method, may, after brood rearing has ceased, be shaken off of their combs on to full combs of honey that are positively free from all infection.

If it is desired to disinfect the old hive it may be done in the following manner:

Paint the entire inner surface of the hive with kerosene oil, fire the same and allow it to burn until the surface is blackened, then throw half a cup of water into the burning hive and quickly put a cover on, which will instantly extinguish the flames.

AMERICAN FOUL BROOD

This disease differs materially from the foregoing, being less malignant and more easily controlled; inasmuch as it spreads less rapidly, however, it is not to be trifled with, as it is also contagious and devastating when neglected. It exists in some sections of this state, also at various points throughout the United States and Canada.

Bacillus alvei is not found in this disease, but instead a bacterium recently named *Bacillus larvae*. The dead larva are at first of a light chocolate color, but gradually turn to a very dark brown, forming a thin scale on the lower side of the cell which is very tenacious and seldom removed by the bees. Before the dead larva dry out they consist of a viscous or ropy fluid which may be drawn out of the cell several inches without breaking. There is also a rank odor present in the hive at this stage of the disease.

In this disease fewer of the larva die before the cells are capped. The capping of these cells when containing dead larva are more or less sunken, of a darker shade and often perforated.

In either form of foul brood, the capped cells are usually scattering, presenting a mottled appearance of the comb, which is a striking characteristic of the disease, on opening a colony in which it is well advanced. At this stage the adult bees are also rather listless and apparently discouraged.

The same treatment and management is recommended as that given for European foul brood. Treatment number one should be followed in this disease.

PICKLED BROOD

This is a peculiar disease of the larva which causes death at about the time of capping of same; sometimes just before.

At this time they are of a light brown color, and have a distended, dropsical appearance.

The skin is rather tough and filled with a watery fluid. The larva usually lie on their backs and lengthwise of the cells, both ends sharply pointed, sometimes having black heads. There is but little if any odor in this disease. The cause is yet undetermined. It is not considered a contagious disease, nor very serious in its effects. In ordinary cases, the bees readily clean out the dead larva a little later.

PALSY OR PARALYSIS

This is a disease of the adult bees only. Often only a few scattering colonies in an apiary will be affected by it, but there are cases on record where whole apiaries have been thus affected. As

there is a constant drain on the adult bees, there is but little if any profit from such colonies for that season.

The diseased bees present a shiny or greasy appearance, as most of the hair on the thorax has disappeared, having probably been removed by other bees in biting and teasing them. Their abdomens are often greatly distended. They also often shake and stagger about, finally leaving the hive, either of their own accord, or through expulsion by the healthy workers of the colony. They drop at the hive entrance, sometimes by hundreds, some crawling about over the ground until they finally disappear.

The cause of this disease is unknown.

Many remedies have been tried and failed. Perhaps the best one is to remove the old queen and substitute a healthy one.

NO NAME DISEASE

The writer has observed in several cases, large numbers of young bees deserting the old colony, crawling about and dying on the ground around the hives, but was unable to find a cause, as the colony contained honey and appeared normal in every other respect, hence cause and remedy unknown.

PROVISIONS OF THE AGRICULTURAL LAW RELATING TO DISEASE AMONG BEES

§ 300. **The prevention of disease among bees.**—No person shall keep in his apiary any colony of bees affected with a contagious malady known as foul brood or black brood; and every beekeeper when he becomes aware of the existence of either of such diseases among his bees, shall immediately notify the commissioner of agriculture of the existence of such disease.

§ 301. **Defining honey.**—The terms “honey,” “liquid or extracted honey,” “strained honey,” or “pure honey,” as used in this article shall mean the nectar of flowers that has been transformed by, and is the natural product of the honey-bee, taken from the honeycomb and marketed in a liquid, candied or granulated condition.

§ 302. **Relative to selling a commodity in imitation or semblance of honey.**—No person or persons shall sell, keep for sale, expose or offer for sale, any article or product in imitation or semblance of honey branded as “honey,” “liquid or extracted honey,” “strained honey” or “pure honey” which is not pure honey. No person or persons, firm, association, company or corporation, shall manufacture, sell, expose or offer for sale any compound or mixture branded or labeled as and for honey which shall be made up of honey mixed with any other substance or ingredient. There may be printed on the package containing such compound or mixture a statement giving the ingredients of which it is made; if honey is one of such ingredients it shall be so stated in the same size type as are the other ingredients, but it shall not be sold, exposed for sale, or offered for sale as honey; nor shall such compound or mixture be branded or labeled with the word “honey” in any form other than as herein provided; nor shall any product in semblance of honey, whether a mixture or not, be sold, exposed or offered for sale as honey, or branded or labeled with the word “honey,” unless such article is pure honey.

§ 303. **Duties of the commissioner.**—The commissioner of agriculture shall immediately upon receiving notice of the existence of foul brood or black brood among the bees in any locality, send some competent person or persons to examine the apiary or apiaries reported to him as being affected, and all the other apiaries in the immediate locality of the apiary or apiaries so reported; if foul brood or black brood is found to exist in them, the person or persons so sent by the commissioner of agriculture shall give the owners or caretakers of the diseased apiary or apiaries full instructions how to treat said cases. The commissioner of agriculture shall cause said apiary or apiaries to be visited from time to time as he may deem best and if, after proper treatment, the said bees shall not be cured of the diseases known as foul brood or black brood then he may cause the same to be destroyed in such manner as may be necessary to prevent the spread of the said diseases. For the purpose of enforcing this article, the commissioner of agriculture, his agents, employees, appointees or counsel, shall have access, ingress and egress to all places where bees or honey or appliances used in apiaries may be, which it is believed are in any way affected with the said disease of foul brood or black brood or where it is believed any commodity is offered

or exposed for sale in violation of the provisions of this article. No owner or caretaker of a diseased apiary, honey or appliances shall sell, barter or give away any bees, honey or appliances from said diseased apiary, which shall expose other bees to the danger of said diseases, nor refuse to allow the said commissioner of agriculture, or the person or persons appointed by him to inspect said apiary, honey, or appliances, and do such things as the said commissioner of agriculture or the person or persons appointed by him shall deem necessary for the eradication of said diseases. Any person who disregards or violates any of the provisions of this section is guilty of a misdemeanor and shall be punished by a fine of not less than thirty dollars nor more than one hundred dollars, or by imprisonment in the county jail for not less than one month nor more than two months, or by both fine and imprisonment.

LAWS RELATING TO WEIGHTS AND MEASURES, AFFECT- ING THE SALE OF HONEY

CHAPTER 20 OF THE CONSOLIDATED LAWS—GENERAL BUSINESS LAW

Article 2 as amended by Chapters 187 and 470 of the Laws of 1910.

ARTICLE 2.

§ 2. **Description of weights and measures.**—The standard weights and measures that were furnished to this state by the government of the United States, in accordance with a joint resolution of congress, approved June fourteenth, eighteen hundred and thirty-six, and consisting of one standard yard measure and one set of standard weights, comprising one Troy pound, and nine avoirdupois weights of one, two, three, four, five, ten, twenty, twenty-five and fifty pounds respectively; one set of standard Troy ounce weights, divided decimally from ten ounces to the one ten-thousandth of an ounce; one set of standard liquid capacity measures, consisting of one wine gallon of two hundred and thirty-one cubic inches, one-half gallon, one quart, one pint and one-half pint measure; and one standard half bushel, containing one thousand and seventy-five cubic inches and twenty one-hundredths of a cubic inch, according to the inch hereby adopted as standard, and such new weights, measures, balances and other apparatus as may be received from the United States as standard weights, measures, balances and apparatus in addition thereto or in renewal thereof as well as such weights, measures, balances and apparatus as may be added by the state department of weights and measures and verified by the national bureau of standards shall be the standard of weights and measures throughout this state. (Amended by Laws of 1910.)

§ 4. **Units of weight.**—The units or standards of weight from which all other weights shall be derived and ascertained, shall be the standard weights designated in this article. The hundred-weight consists of one hundred avoirdupois pounds and twenty hundred weight are a ton. In all transactions relating to the sale or delivery of coal two thousand avoirdupois pounds in weight shall constitute a legal ton. (Amended by Laws of 1910.)

§ 5. **Units of capacity.**—The units or standards of measure of capacity for liquids from which all other measures shall be derived and ascertained shall be the standards designated in this article. The barrel is equal to thirty-one and one-half gallons and two barrels are a hogshead. The parts of the liquid gallon shall be derived from the gallon by continual division by the number two, so as to make half gallons, quarts, pints, half pints and gills. The peck, half peck, quarter peck, quart, pint and half pint for measuring commodities which are not liquids shall be derived from the half bushel by successively dividing that measure by two. The standard of measure for buying and selling strawberries, raspberries, blackberries, currants, gooseberries, plums, cherries, cranberries and other small fruits shall be the quart, which shall contain when even full sixty-seven and two-tenths cubic inches; the pint, which when even full shall contain thirty-three and

six-tenths cubic inches; the half pint, which when even full shall contain sixteen and eight-tenths cubic inches; multiples of the quart, which when even full shall contain like multiples of sixty-seven and two-tenths cubic inches.

ARTICLE 26.

§ 390. **Marking canned goods.**—No packer or dealer in hermetically sealed, canned or preserved fruits, vegetables or other articles of food within this state, excepting canned or condensed milk or cream, shall sell or offer the same for sale for consumption within this state, unless the cans or jars containing the same shall have plainly printed upon a label thereupon, with a mark or term clearly indicating the grade or quality of the articles contained therein, the name, address and place of business of the person or corporation canning or packing them, or the name of the wholesale dealer in the state selling or offering the same for sale, and the name of the state, county and city, town or village where packed, preceded by the words "packed at."

If containing soaked goods or goods put up from products dried or cured before canning, there shall also be printed upon the face of such label in good legible type, one-half of an inch in height and three-eighths of an inch in width, the word "soaked."

Goods imported from foreign countries of foreign manufacture shall not be subject to the provisions of this section.

Any person violating any of the provisions of this section shall forfeit to the city, village, or town where the violation occurs, the sum of fifty dollars, if a retail dealer, and the sum of five hundred dollars, if a wholesale dealer or packer.

CHAPTER 40 OF THE CONSOLIDATED LAWS—PENAL LAW

ARTICLE 40.

§ 421. **Untrue and misleading advertisements.**—Any person, firm, corporation or association, or any employee thereof, who, in a newspaper, circular or other publication published in this state, knowingly makes or disseminates any statement or assertion of fact concerning the quantity, the quality, the value, the method of production or manufacture, or the reason for the price of his or their merchandise, or the manner or source of purchase of such merchandise or the possession of rewards, prizes or distinctions conferred on account of such merchandise or the motive or purpose of a sale, intended to give the appearance of an offer advantageous to the purchaser which is untrue or calculated to mislead, shall be guilty of a misdemeanor.

Any person, firm, corporation or association or any employee thereof who violates any provision of this section shall be liable to a fine of not less than twenty-five nor more than one hundred dollars for each offense.

§ 434. **Concealing foreign matter in merchandise.**—A person who, with intent to defraud, while putting up in a barrel, bag, bale, box, or other package, cotton, hops, hay, or any other article of merchandise whatever, usually sold by weight in such packages, places or conceals therein any other substance or thing whatever, in a case where special provision for the punishment thereof is not otherwise made by statute, is guilty of a misdemeanor.

§ 435. **False labels.**— A person, who, with intent to defraud: 1. Puts upon an article of merchandise, or upon a cask, bottle, stopper, vessel, case, cover, wrapper, package, band, ticket, label, or other thing, containing or covering such an article, or with which such an article is intended to be sold, or is sold, any false description or other indication of or respecting the kind, number, quantity, weight or measure of such article, or any part thereof, or the place or country where it was manufactured or produced or the quality or grade of any such article, if the quality or grade thereof is required by law to be marked, branded or otherwise indicated on or with such article; or,

2. Sells or offers for sale an article, which to his knowledge is falsely described or indicated upon any such package, or vessel containing the same, or labeled thereupon, in any of the particulars specified; or,

3. Sells or exposes for sale any goods in bulk to which no name or trade-mark shall be attached, and orally or otherwise represents that such goods are the manufacture or production of some other than the actual manufacturer or producer, in a case where the punishment for such offense is not specially provided for otherwise by statute,

Is guilty of a misdemeanor.

§ 436. **Using false marks as to manufacture.**— A person, who, with intent to defraud or to enable another to defraud any person, manufactures or knowingly sells or causes to be manufactured or sold, any article, marked, stamped or branded or incased or inclosed in any box, bottle or wrapper, having thereupon any engraving or printed label, stamp, imprint, mark or trade-mark which article is not the manufacture, workmanship or production of the person named, indicated or denoted by such marking, stamping or branding, or by or upon such engraving, printed label, stamp, imprint, mark or trade-mark, is guilty of a misdemeanor.

PRELIMINARY REGULATIONS AND REQUIREMENTS UNDER CHAPTER 81 OF THE LAWS OF 1912.

Under the provisions of chapter 81 of the Laws of 1912 commodities must be sold by weight, measure or numerical count. In establishing rules and regulations, as provided for by such chapter, it has been deemed wise and proper to establish certain regulations at once.

The following regulations have been prepared by the Superintendent of Weights and Measures and the chief or principal weights and measures officials of the cities of the first class, namely:

F. REICHMANN, Superintendent of Weights and Measures of the State of New York.

J. L. WALSH, Commissioner of Weights and Measures of the City of New York.

C. J. QUINN, Sealer of Weights and Measures of the City of Buffalo.

J. H. STEPHENSON, Sealer of Weights and Measures of the City of Rochester.

(4) *Commodities in glass bottles or jars.* Commodities in glass bottles shall show the contents in one of the following ways:

1. The capacity in terms of gallons, quarts, pints, or half pints, or in terms of fluid ounces, may be blown in the side or neck of the bottle. Such letters shall be at least three-eighths of an inch ($\frac{3}{8}$ " in height for bottles

having a capacity of six ounces or over, and one-fourth of an inch ($\frac{1}{4}$ ") for bottles having a capacity of over two fluid ounces but less than six fluid ounces, and must be exposed, that is, must not be covered by label or other covering.

2. The quantity of the contents of the bottle when filled may be stated in terms of weight or in terms of fluid measure, the weight being indicated in terms of avoirdupois pounds and ounces and the fluid measure being indicated in terms of gallons, quarts, pints, half pints or gills or fluid ounces. The marking to be on a tag attached to the bottle or upon a label. The letters shall be in bold-faced type at least one ninth of an inch ($\frac{1}{9}$ ") in height for bottles or jars having a capacity of gill, half pint, one pint or multiples of a pint, and letters at least three-sixteenths of an inch ($\frac{3}{16}$ ") in height for bottles of other capacities on a part of the tag or label free from other printing or ornamentation, leaving a clear space around the marking which indicates the contents.

3. If the bottles are capped the marking may be on the cap in terms of the weight of the contents or in terms of the fluid capacity of the contents. The lettering and designation being the same as those indicated in 2 above.

4. If the marking is etched or ground in the surface of the bottle the letters and figures shall be at least one-quarter of an inch ($\frac{1}{4}$ ") in height. The manner of expressing the contents being the same as those indicated in 1 and 2 above.

Variation. The variation in glass bottles shall be in excess of those allowed by agreement between the Glass Bottle Blowers Association of the United States and Canada and manufacturers of glass bottles by the following amounts: those having a capacity of 2 fluid ounces to 6 fluid ounces inclusive, 3%; over 6 fluid ounces to 16 fluid ounces inclusive, 2%; over 16 fluid ounces to 32 fluid ounces inclusive, $1\frac{1}{2}$ %; over 32 fluid ounces, 1%.

The variation of the bottles themselves is prescribed by section 12 of the rules and regulations agreed upon and adopted by the above named blowers and manufacturers and is as follows:

"Section 12. Manufacturers shall allow one-quarter ounce each way, from one-half to six ounces in weight, inclusive; above six ounces to twelve ounces, inclusive, one-half ounce each way; above twelve ounces to thirty-two ounces, inclusive, one ounce each way; above thirty-two ounces to forty ounces, inclusive, two ounces each way."

NOTE. Imported bottled goods, which have been bottled and marked in foreign countries and offered for sale in this State, may be labeled and marked in terms of kilograms or grams of weight or liters (or cubic centimeters), other conditions and size of marking same as above.

(5) In connection with the weight, measure or numerical count, a statement such as the "minimum," "not less than," or a statement that the contents are not "over" a certain amount or a statement that the contents are "between" certain limits will not be permissible. The law contemplates that a statement of the weight, measure or numerical count shall be within reasonable limits and such reasonable limits would constitute an average.

(6) *General regulation.* In all the regulations unless otherwise stated, "a variation" shall be interpreted to mean that such variation on commodities shall be as often above as below.

(7) *Commodities which appear as a unit in the state of nature* may be sold either by weight, measure or count. As an illustration: eggs may be sold by the count or by the dozen; comb honey may be sold by the comb; but where the container containing these individual units contains more than six, it must be marked, for instance, egg carriers, if there are over six eggs in the carrier, must be marked with the number of eggs contained therein, in letters at least half as large as the largest printing on the side or top of the packages on which the indication appears, or where no other printing is present, in letters at least one-fourth of an inch in height.

SPRAYING FRUIT TREES WHEN IN BLOOM

This question must be considered from two standpoints: First: What is the effect on the fruit when spraying is made with arsenical poisons?

The New York Agricultural Experiment Station in the season of 1900 made some careful investigations in cooperation with the Cornell Experiment Station. A description of the experiments and their results was given in Bulletin No. 196. The results show that spraying in bloom tends to thin the fruit if the treatment is given soon after the buds open. When trees had a great abundance of blossoms, spraying but once during the blooming season lessened the yield somewhat. By spraying repeatedly during the blooming season, thus hitting the blossoms as they opened from day to day, the blossoms were nearly all destroyed, and as a consequence scarcely any fruit set.

Second: What is the effect on honey bees when they visit trees that have been sprayed with arsenical poisons?

The only recorded experiments on this question show that careful investigation was made by Prof. Webster at the Experiment Station at Wooster, Ohio. These experiments were reported in Ohio Bulletin No. 68. In summing up the matter Prof. Webster says that he can draw no other conclusion from the results of his experiments than that the bees are liable to be poisoned if the bloom of fruit trees is sprayed; the liability increasing in proportion as the weather is favorable for the activity of the bees, and that all bloom must have fallen from the trees before the danger will have ceased.

The best authorities in this state are all agreed that there is little need of spraying when trees are in full bloom, and as long as there seems to be some risk to bees, the law prohibiting such spraying is generally approved.

The following is a copy of the law in the State of New York: Section 1757. Penal Law.

Spraying Fruit Trees with Poison.—Any person who will spray with, or apply in any way poison or any poisonous substance, to fruit trees while the same are in blossom, is guilty of a misdemeanor, punishable by a fine of not less than ten (\$10) dollars or more than fifty (\$50) dollars for each offense;

LITERATURE ON BEES AND THEIR CULTURE

Everyone interested in bees should acquire one or more of the standard text books on the subject, a number of which are here enumerated.

"A B C and X Y Z of Bee Culture," by A. I. and E. R. Root, 712 pages; 1913. This is a valuable work for any beekeeper; it is frequently revised and kept up-to-date.

"Advanced Bee Culture," by W. Z. Hutchinson, 200 pages; 1912.

"Fifty Years Among the Bees," by Dr. C. C. Miller, 352 pages; 1912.

"Langstroth, on the Honey Bee," by C. P. Dadant, 575 pages.

"How to Keep Bees," by Anna Botsford Comstock, 228 pages. A good book for beginners.

Periodicals on Bee Culture

A man cannot know too much about his business; hence it is advisable for the amateur to invest in at least one periodical. The following are published in the United States.

"Gleanings in Bee Culture," published by the A. I. Root Co., Medina, Ohio, semi-monthly, \$1.00 per annum.

"The American Bee Journal," edited by C. P. Dadant and Dr. C. C. Miller, published at Hamilton, Illinois, monthly, \$1.00 per annum.

United States Bulletins

A number of valuable bulletins on various subjects of interest to beekeepers, are published by the United States Department of Agriculture. The following are of especial value, and may be obtained by addressing the Secretary of Agriculture, Washington, D. C.:

Farmers' Bulletin No. 447, "Bees." By E. F. Phillips, Ph.D., 1911, 48 pages, 25 figures. A general account of the management of bees.

Farmers' Bulletin No. 442, "The Treatment of Bee Diseases." By E. F. Phillips, Ph.D., 1911, 22 pages, 7 figures. This publi-

cation gives briefly the symptoms of the various bee diseases with directions for treatment.

Circular No. 94, "The Cause of American Foul Brood." By G. F. White, Ph.D., 1907, 4 pages.

Bulletin No. 55, "The Rearing of Queen Bees." By E. F. Phillips, Ph.D., 1905, 32 pages, 17 figures.

Bulletin No. 75, Part I, "The Production and Care of Extracted Honey." By E. F. Phillips, Ph.D. "Method of Honey Testing for Beekeepers." By S. A. Browne, Ph.D., 1907, 18 pages.

The method of producing extracted honey, with special reference to the care of honey after it is taken from the bees, so that its value may not be decreased by improper handling. The second portion of the publication gives some simple tests of adulteration.

Bulletin No. 75, Part II, "Wax Moths and American Foul Brood." By E. F. Phillips, Ph.D., 1907, pages 19-22. 3 plates.

BEEKEEPERS' ORGANIZATION

All persons thoroughly interested in the pursuit of beekeeping should become members of one or more beekeepers' societies. At the conventions held by these societies, an opportunity is afforded to exchange ideas, to impart and receive information of value, and all should find them both pleasant and profitable. "In union there is strength."

THE NATIONAL BEEKEEPERS ASSOCIATION

Officers

Dr. Burton N. Gates, President, Amherst, Mass.

Dr. H. A. Surface, Vice-President, Harrisburg, Pa.

E. B. Tyrell, Secretary, 214 Hammond building, Detroit, Mich.

C. P. Dadant, Treasurer, Hamilton, Ill.

Directors

E. D. Townsend, Northstar, Mich.

J. M. Buchanan, Franklin, Tenn.

Wesley Foster, Boulder, Colo.

F. B. Cavanaugh, Hebron, Ind.

Prof. Wilmon Newell, College Station, Texas.

"Object"

(From the constitution of the National Beekeepers' Association.)

"The object of this association shall be to aid its members in the business of beekeeping, to help in the sale of their honey and beeswax and to promote the interest of beekeepers in any other direction decided upon the board of directors."

"Official Organ"

"The Beekeepers' Review, a monthly publication shall be published by this association as its official organ."

Membership in the National Association is through its affiliated associations, either state or local, and all members receive the official organ free.

THE NEW YORK STATE ASSOCIATION OF BEEKEEPERS' SOCIETIES

George B. Howe, President, Black River.

Oscar Dines, Vice-President, 105 Seeley avenue, East Onondaga.

Irving Kinyon, Secretary-Treasurer, Camillus.

The membership of this society is composed of delegates from the local affiliated societies and meets annually.

LOCAL ASSOCIATIONS

Adirondack — President, George Cary, Gansevoort; Secretary, H. E. Gray, Fort Edward.

This association is a branch of the National Association. Membership fee \$1.50.

Cayuga — President, N. L. Stevens, Route 18, Moravia; Secretary, J. W. Pierson, Route 33, Union Springs.

Cortland — President, L. F. Horton, McGraw; Secretary, Dana Denison, Truxton.

Eastern, N. Y. — President, W. D. Wright, Altamont; Secretary, S. Davenport, Indian Fields.

Fulton-Montgomery — President, G. W. Haines, Mayfield; Secretary, Charles Stewart, Johnstown.

Jefferson — President, A. A. French, Black River; Secretary, Hudson Shaver, Limerick.

Livingston-Wyoming — President, George W. Collier, Warsaw; Secretary, Charles T. Humphrey, Warsaw.

Monroe — President, Fred Baetzel, 351 Mount Hope avenue, Rochester; Secretary, R. J. Ruliffson, 735 Mount Hope avenue, Rochester.

Onondaga — President, P. G. Clark, Marietta; Secretary, J. H. Cunningham, 303 Syracuse University, Syracuse.

Oswego — President, Mortimer Stevens, Pennellville; Secretary, Charles B. Allen, Central Square.

Ontario — President, W. F. Marks, Route 2, Clifton Springs; Secretary, F. Greiner, Naples.

St. Lawrence — President, F. C. Hutchins, Massena Springs, Secretary, Rasine Thompson, Depuyster.

Seneca — President, C. J. Baldrige, Kendaia; Secretary, C. B. Howard, 59 Lyceum street, Geneva.

Western New York — President, Rev. J. T. Green, Interlaken; Secretary, Earl F. Case, Canandaigua.

The membership fees of these societies range from \$1 to \$1.50 per annum and no beekeeper who purchases bee supplies can afford to remain outside, whether he attends the meetings or not, as all these bodies obtain special discounts on supplies and periodicals. Anyone desiring to join any society is advised to correspond with the respective secretaries for terms, etc.

AGENTS---BEE INSPECTION WORK

Appointed under the provisions of sections 300, 301, 302 and 303 of the Agricultural Law.

First Division

Comprising the counties of Albany, Clinton, Columbia, Dutchess, Essex, Greene, New York, Putnam, Rensselaer, Saratoga, Schenectady, Warren, Washington, Westchester. Wheeler D. Wright, Agent, Altamont, N. Y.

Second Division

Broome, Chemung, Chenango, Delaware, Kings, Nassau, Orange, Otsego, Queens, Richmond, Rockland, Schoharie, Suffolk, Sullivan, Tioga, Tompkins, Ulster. N. D. West, Agent, Middleburg, N. Y.

Third Division

Allegany, Cattaraugus, Chautauqua, Cortland, Fulton, Hamilton, Herkimer, Livingston, Madison, Montgomery, Oneida, Schuyler, Steuben, Wyoming, Yates. Charles Stewart, Agent, Sammons ville, N. Y.

Fourth Division

Cayuga, Erie, Franklin, Genesee, Jefferson, Lewis, Monroe, Niagara, Onondaga, Ontario, Orleans, Oswego, Seneca, St. Lawrence, Wayne. Mortimer Stevens, Pennellville, N. Y.

STATUS OF BEEKEEPING IN THE STATE OF NEW YORK ACCORDING
TO THE CENSUS OF 1910*

| Counties | No. colonies of bees | Value in dollars‡ | Counties | No. colonies of bees | Value in dollars |
|------------------|-------------------------|----------------------|------------------|-------------------------|---------------------|
| Albany | 3, 035 | \$12, 206 | Onondaga | 3, 979 | 17, 591 |
| Allegany | 5, 620 | 21, 606 | Ontario | 4, 091 | 16, 392 |
| Broome | 3, 312 | 12, 985 | Orange | 1, 906 | 9, 534 |
| Cattaraugus | 4, 927 | 19, 029 | Orleans | 1, 703 | 6, 713 |
| Cayuga | 4, 789 | 20, 477 | Oswego | 2, 602 | 9, 572 |
| Chautauqua | 3, 680 | 14, 745 | Otsego | 2, 071 | 9, 568 |
| Chemung | 2, 240 | 7, 087 | Putnam | 366 | 1, 671 |
| Chenango | 2, 598 | 11, 540 | Queens | 14 | 130 |
| Clinton | 1, 829 | 6, 546 | Rensselaer | 2, 220 | 9, 496 |
| Columbia | 2, 055 | 9, 067 | Richmond | 295 | 2, 066 |
| Cortland | 2, 524 | 9, 830 | Rockland | 443 | 2, 252 |
| Delaware | 4, 546 | 20, 481 | St. Lawrence ... | 5, 369 | 23, 474 |
| Dutchess | 2, 070 | 9, 811 | Saratoga | 1, 835 | 8, 208 |
| Erie | 5, 195 | 20, 861 | Schenectady | 1, 431 | 5, 939 |
| Essex | 1, 035 | 4, 753 | Schoharie | 6, 133 | 23, 318 |
| Franklin | 1, 087 | 4, 937 | Schuyler | 1, 929 | 5, 542 |
| Fulton | 1, 265 | 5, 372 | Seneca | 3, 084 | 15, 189 |
| Genesee | 2, 339 | 9, 717 | Steuben | 7, 576 | 23, 074 |
| Greene | 2, 244 | 9, 574 | Suffolk | 111 | 654 |
| Hamilton | 248 | 1, 491 | Sullivan | 2, 570 | 12, 865 |
| Herkimer | 2, 179 | 10, 758 | Tioga | 2, 820 | 9, 828 |
| Jefferson | 4, 574 | 22, 088 | Tompkins | 4, 536 | 14, 681 |
| Kings | 12 | 70 | Ulster | 2, 735 | 14, 278 |
| Lewis | 1, 026 | 3, 709 | Warren | 816 | 4, 912 |
| Livingston | 3, 700 | 14, 141 | Washington | 2, 890 | 11, 898 |
| Madison | 2, 753 | 10, 201 | Wayne | 2, 433 | 9, 946 |
| Monroe | 2, 724 | 12, 797 | Westchester | 1, 090 | 6, 723 |
| Montgomery | 3, 615 | 15, 234 | Wyoming | 3, 579 | 15, 223 |
| Nassau | 207 | 1, 377 | Yates | 2, 142 | 7, 439 |
| New York | 2 | 5 | | | |
| Niagara | 2, 837 | 13, 211 | Total | 156, 360 | \$646, 848 |
| Oneida | 3, 324 | 12, 966 | | | |

Honey and Wax, 1909. Although as noted elsewhere, 15,259 farms reported 156,360 colonies of bees on hand April 15, 1910, 4,863 of these farms, with 16,829 colonies on hand April 15, 1910 made no report of honey or wax produced in 1909. The actual returns show the production of 3,191,733 pounds of honey, valued at \$376,608 and 43,198 pounds of wax, valued at \$13,034; the true totals are doubtless somewhat above these figures.

* Taken from Report of the Thirteenth Census of the United States, 1910.



FIG. 74. Basswood in bloom.



FIG. 75. Apiary of D. W. Trescott, Conesus, N. Y.

(Original)

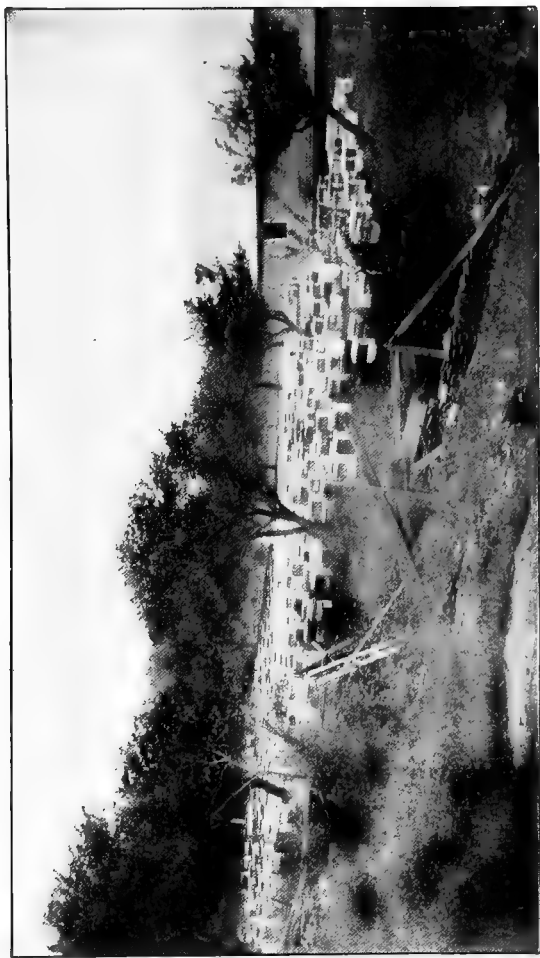


FIG. 76. Apiary of F. W. Alexander, Delanson, N. Y., containing upward of 700 colonies at the time this photo was taken.



FIG. 77. Interior of F. W. Alexander's honey extracting room.



FIG. 78. Home apiary of George B. Howe, Black River, N. Y.

(Original)



FIG. 79. An out-apiary of W. D. Wright run for comb honey.

(Original)

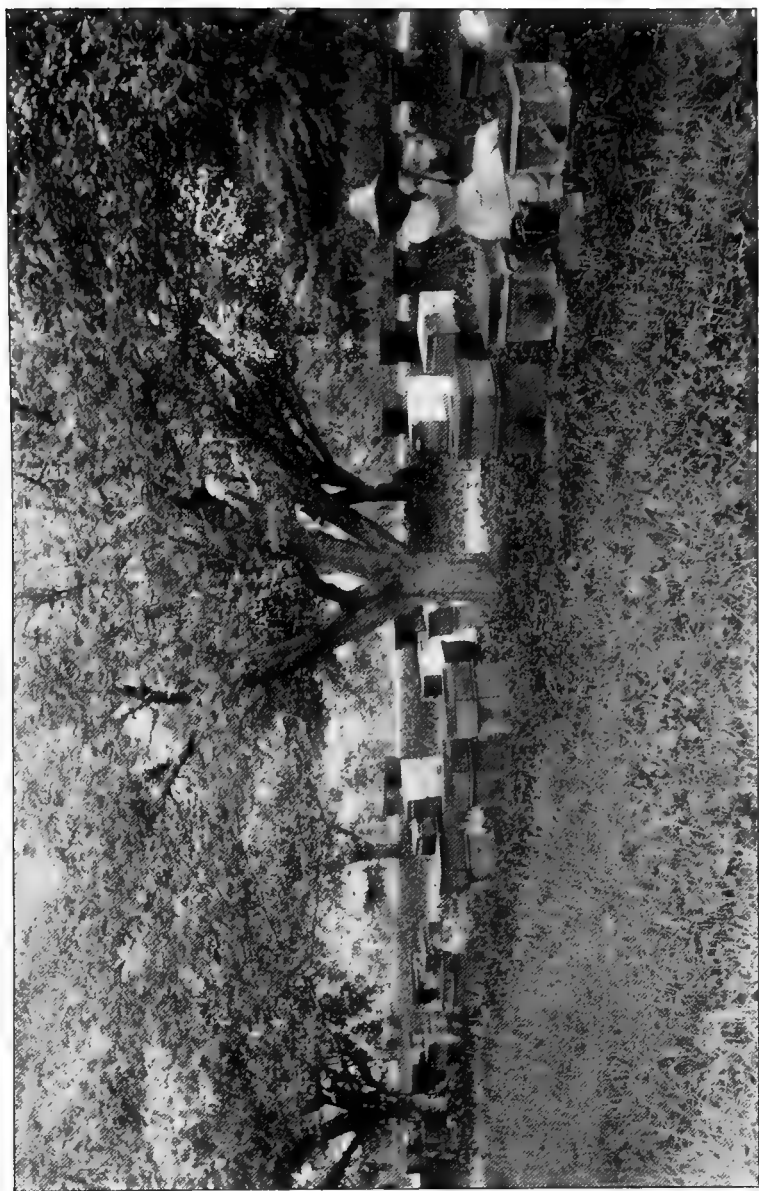


FIG. 80. Apiary of Miss Hettie E. Hoffman, Canajoharie, N. Y.

(Original)

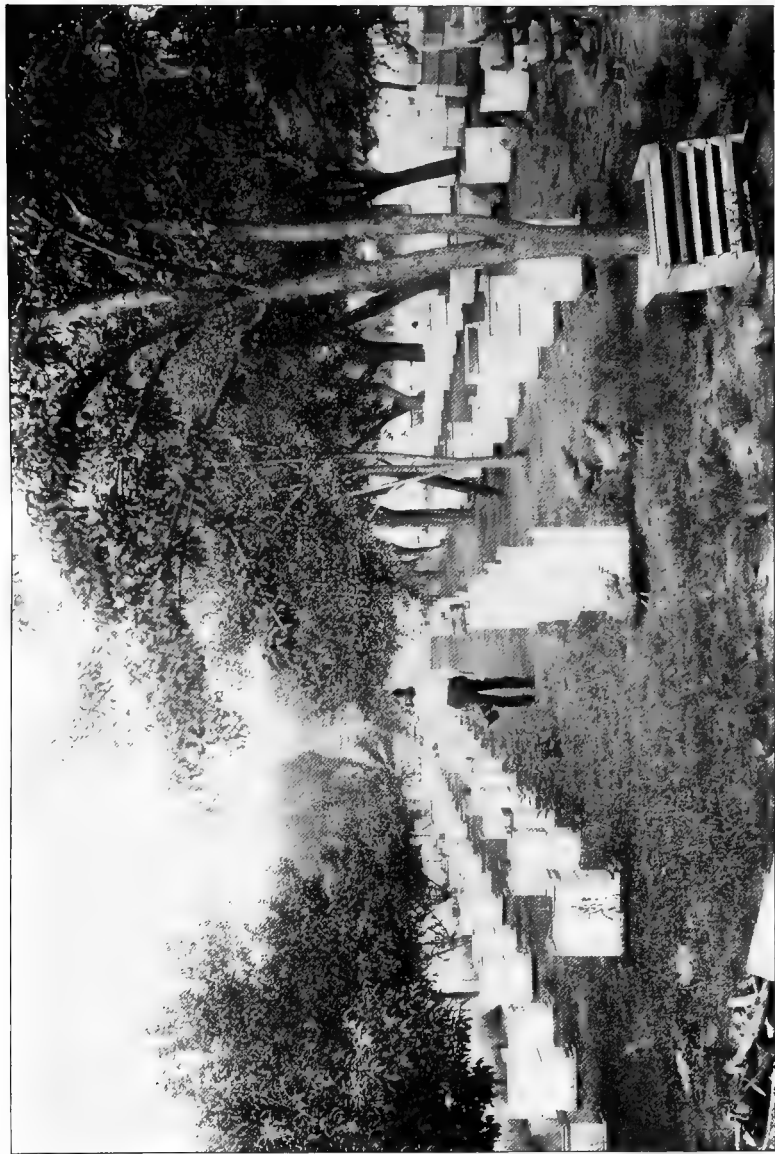


FIG. 82. Apiary of Mr. Frank Hinman, Gallupville, N. Y., run for the production of extracted honey.
(Original)

1. 1000



FIG. 83. Home apiary of D. L. Woodward, Clarksville, N. Y.

(Original)



FIG. 84. Home apiary of W. D. Wright, Altamont, N. Y. Comb and extracted honey produced.

(Original)

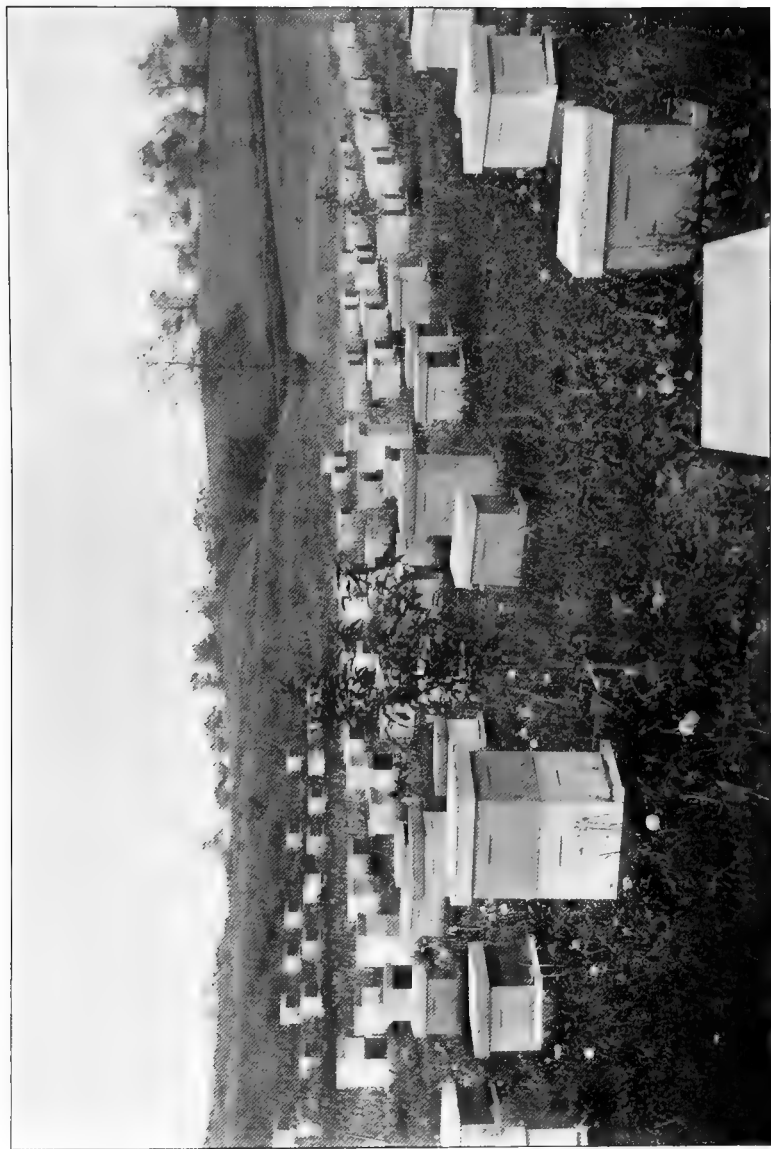


FIG. 85. Apiary of P. W. Stahlman, West Berne, N. Y., run for the production of extracted honey. (Original)

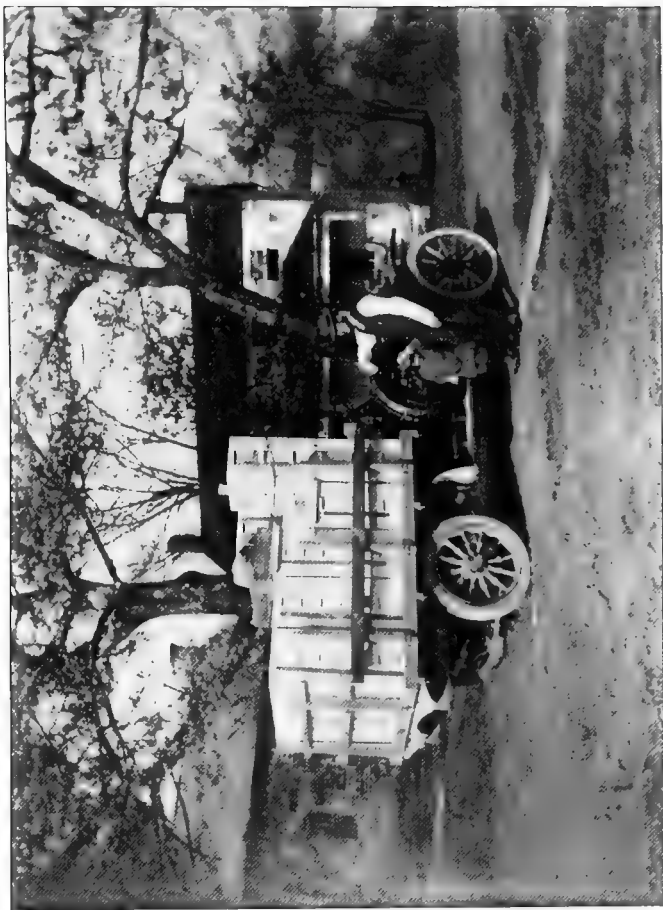


FIG. 86. Fiat, forty horsepower auto truck adapted to the business of honey production, marketing, etc., owned by D. L. Woodward, Clarksville, N. Y. (Original)

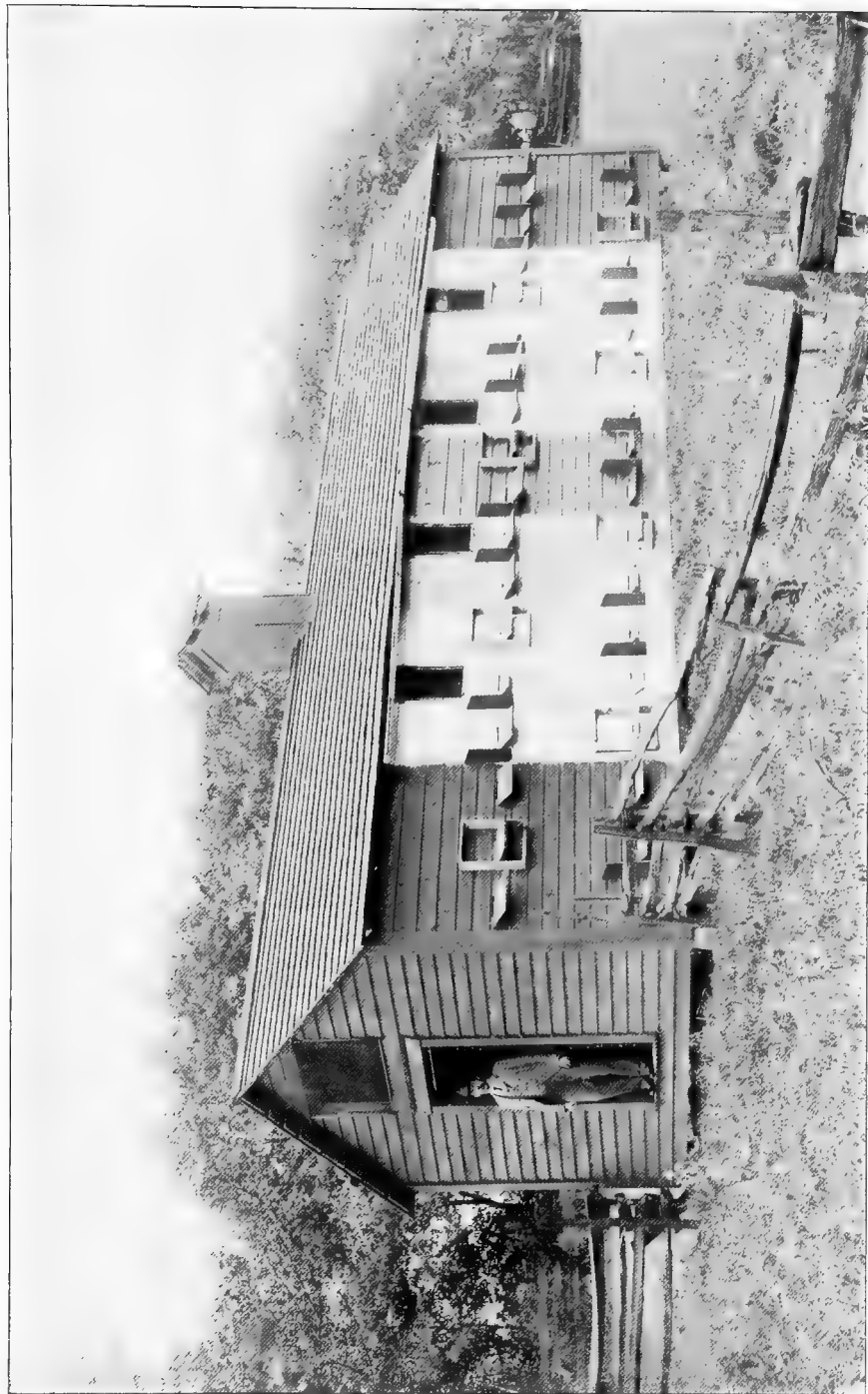


FIG. 87. House apiary of F. H. Loucks, Lowville, N. Y. (Wilcox yard).

(Original)

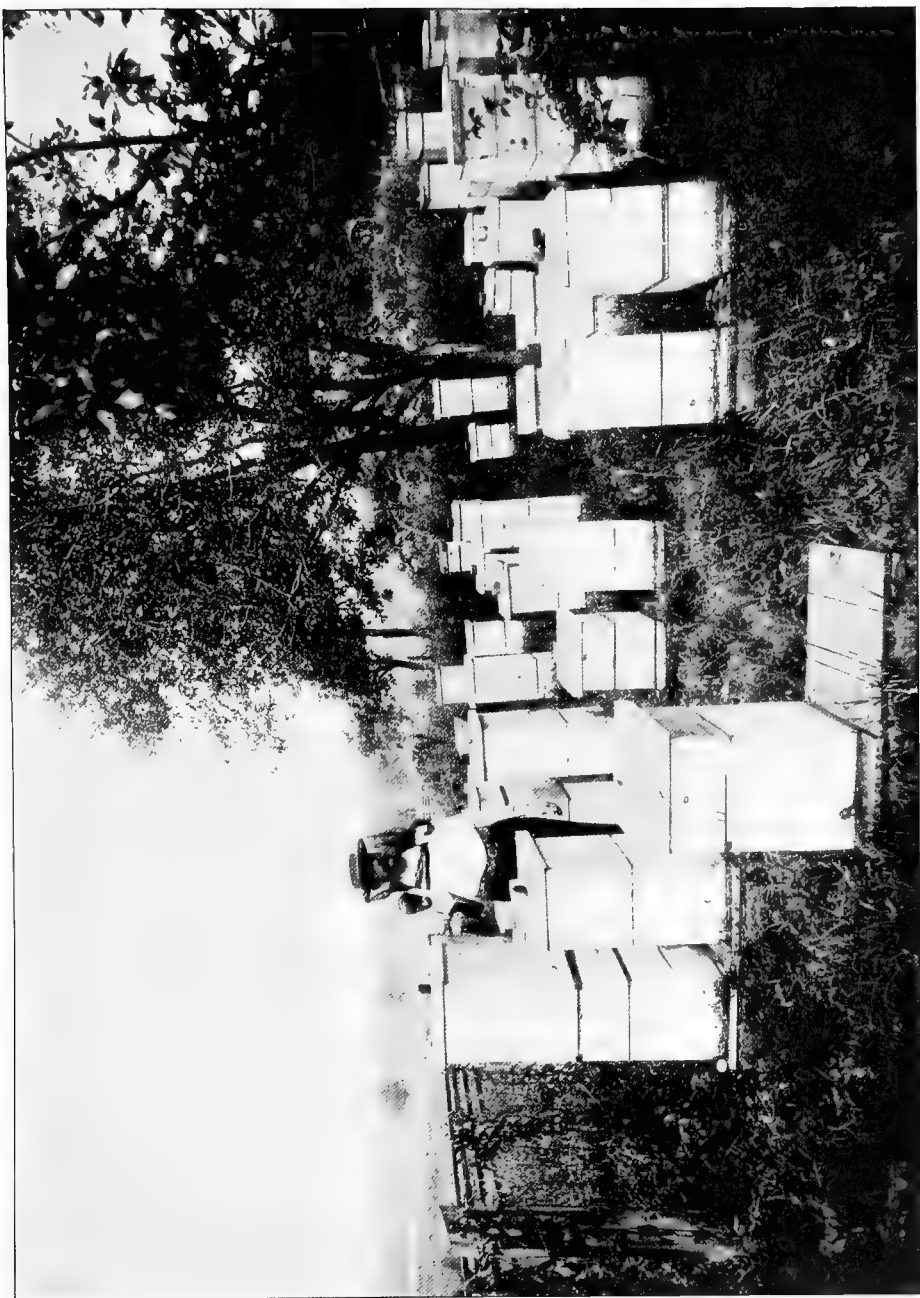


FIG. 88. Apiary of H. E. Gray, Fort Edward, N. Y.

(Original)

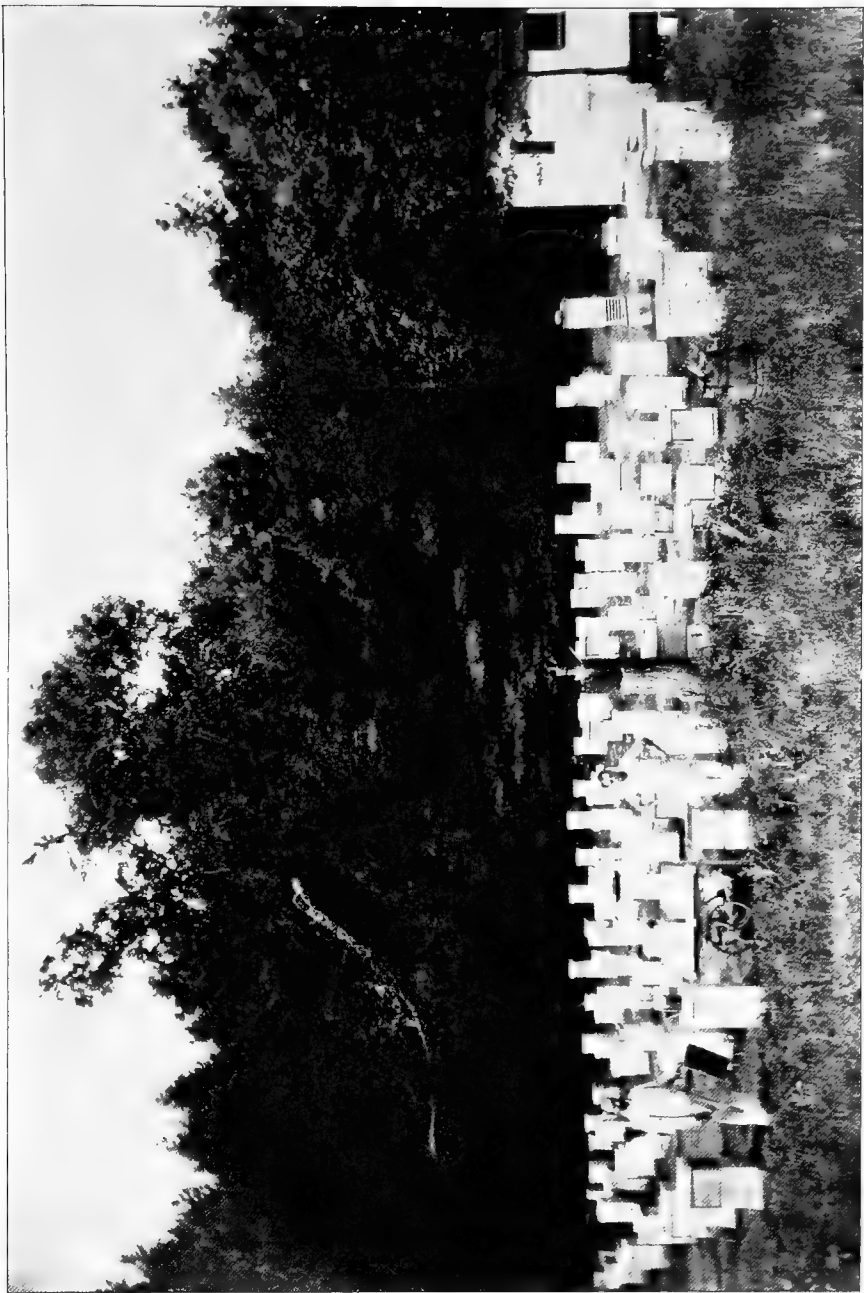


FIG. 89. Apiary of D. C. Stahlman, Knox, N. Y., run solely for extracted honey. Truck for hauling honey in foreground; extracting house in the distance.
(Original)



FIG. 90. Apiary of George Cary, Gansevoort, N. Y., run for comb honey production. (Original)

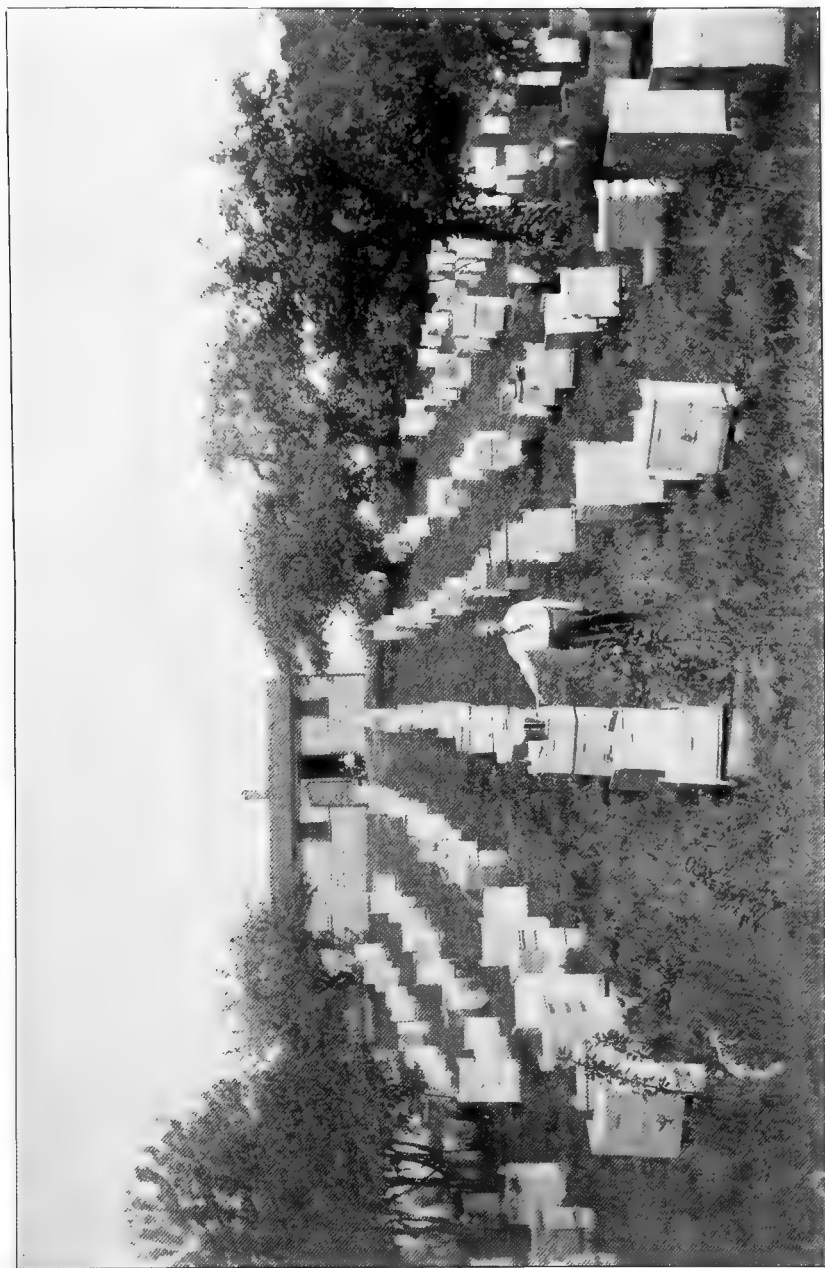


FIG. 91. Out-apiary of W. D. Wright, Altamont, N. Y.

(Original)



FIG. 92. Apiary of I. Van Auken, Altamont, N. Y., where both comb and extracted honey are produced. (Original)

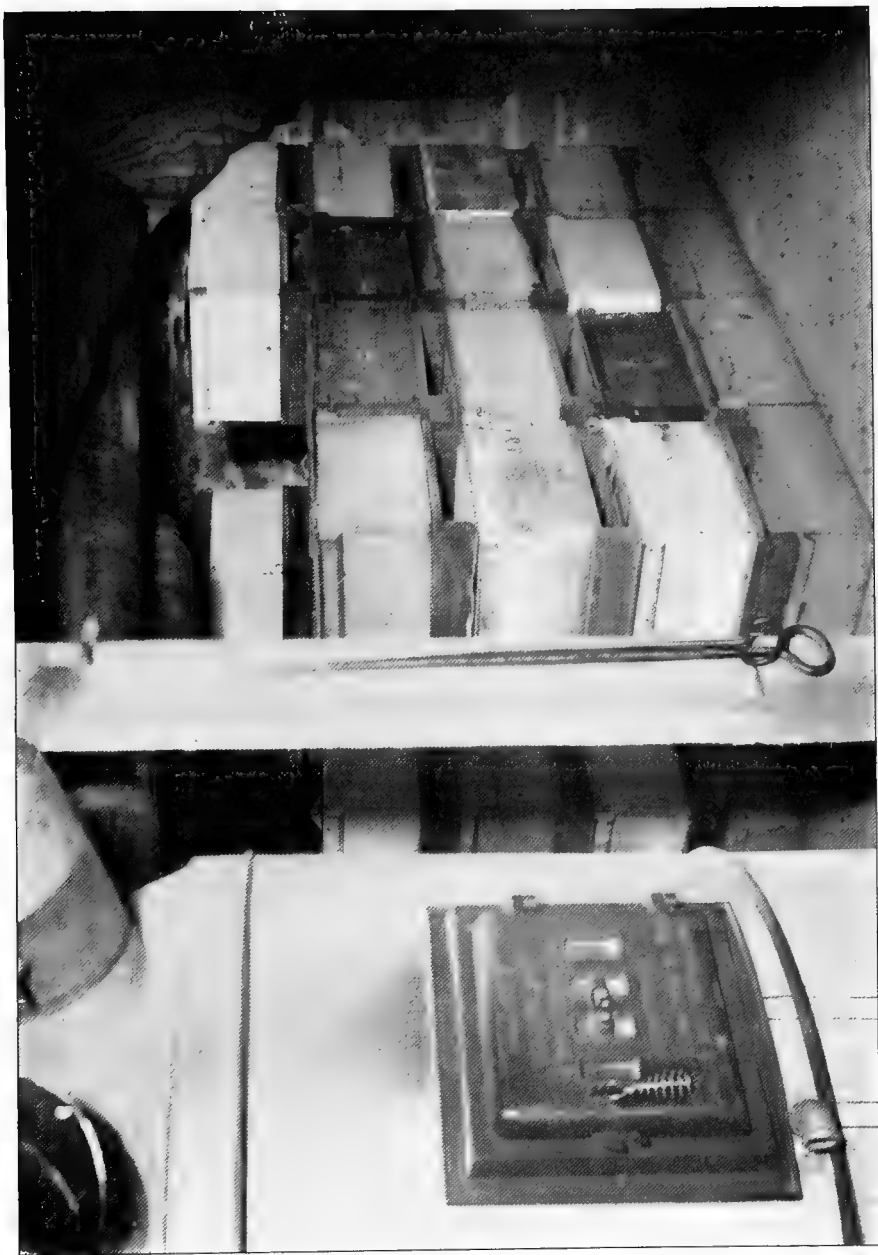


FIG. 93. Wintering bees in cellar containing furnace. The hives nearest furnace were but three feet distant. The temperature of this cellar ran as high as 60° and bees wintered well. (Original)

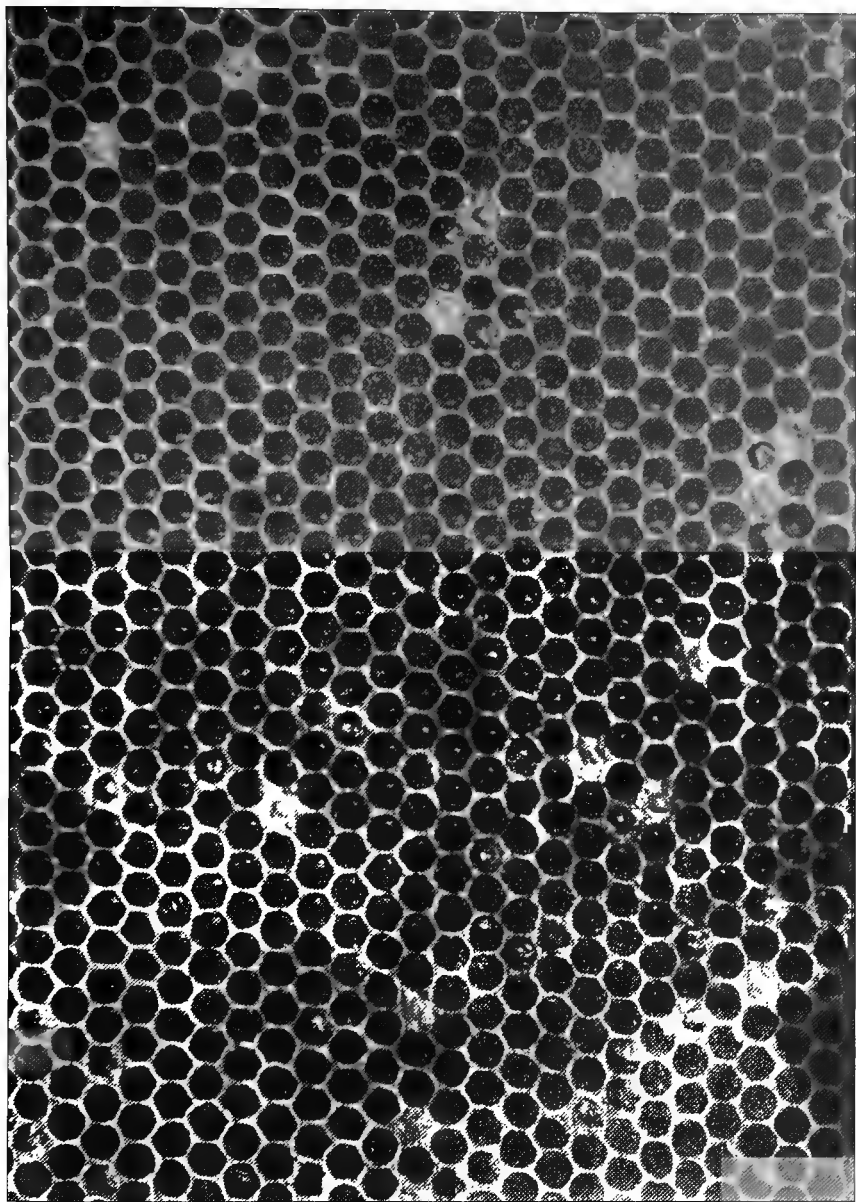
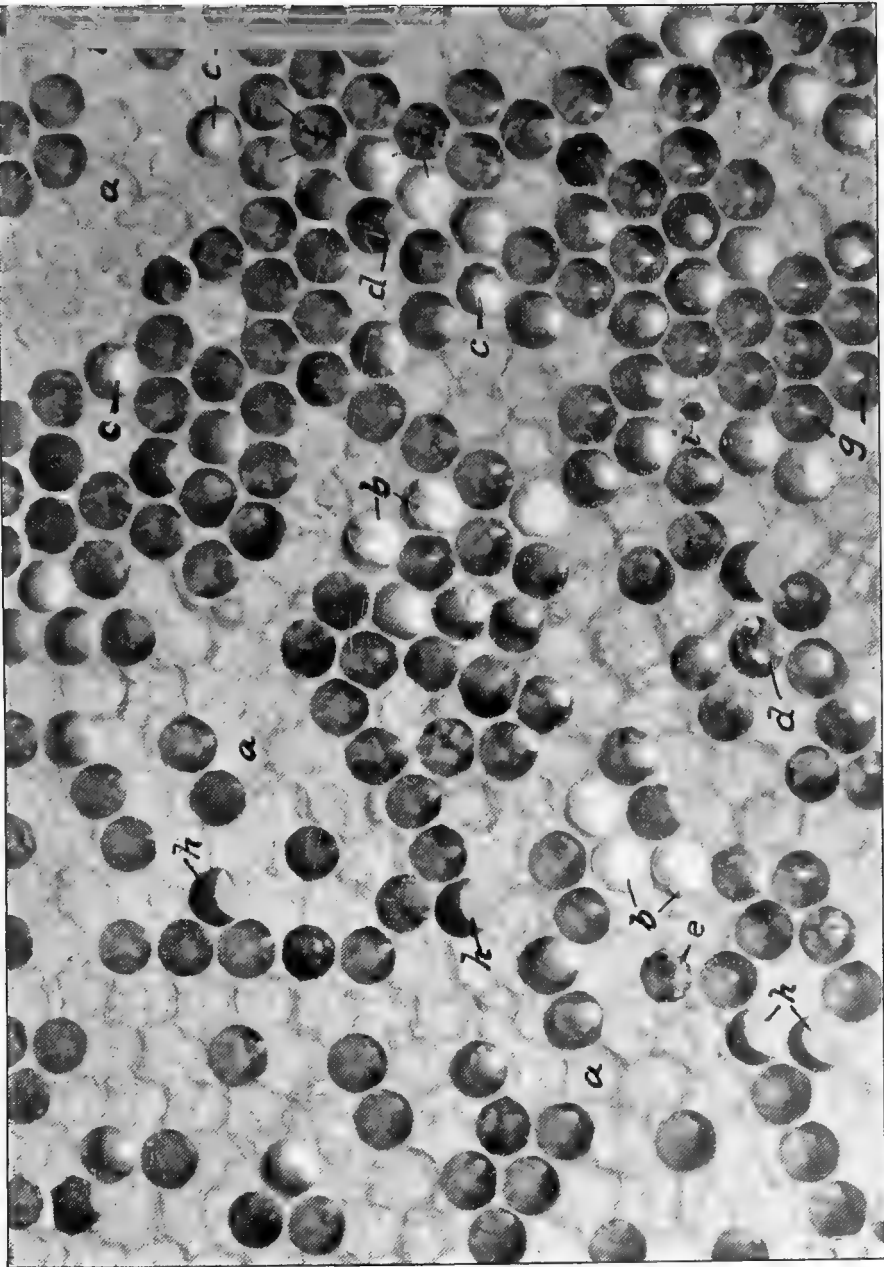
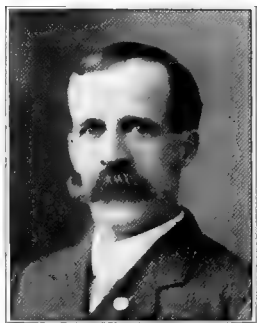


FIG. 94. Pickled Brood. Note the pointed larvae in many of the cells, which is a characteristic of this disease.
(Original)



- a. Healthy capped brood.
- b. Healthy larva.
- c. Larva soon after death, white but distorted.
- d. Dead larva, of semi-fluid consistency, brown in color, occasionally slightly ropy.
- e. Dried dead larva, dark brown color.
- f. Dried scales from dead larva, light yellow color.
- g. Eggs recently laid by queen.
- h. Cells of pollen.
- i. Diseased capped cells, cap-pings perforated.

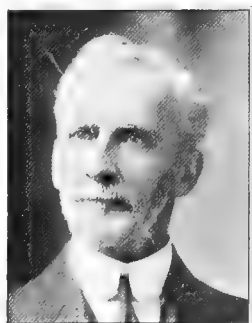
FIG. 95. European Foul Brood (from worker brood, much enlarged). In the sample from which this photo was taken, the disease was not far advanced. (Original)



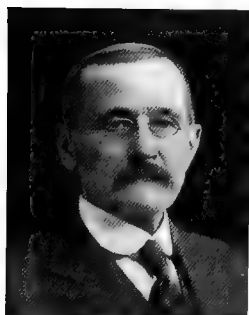
F. B. Loucks



Rev. Isaac V. Lobbell



W. D. Wright



H. L. Case



N. D. West
(Original)



Charles Stewart

THE ITALIAN BEE AS A FACTOR IN THE EXTERMINATION OF EUROPEAN FOUL BROOD*

W. D. WRIGHT, ALTAMONT, N. Y.

For ten years past, I have strenuously advocated the Italianization of all black or hybrid bees, located in or near any locality where European foul brood was epidemic. This has been attended with more or less success, depending upon the action of the parties directly interested. Some beekeepers were incredulous of the claims made by me, and seemed to regard them as extravagant, or thought that the purchasing of Italian queens was an unnecessary expense, or perchance, that I was interested in the sale of queens, etc., thus accounting for my insistence on this point believing there must be some profit accruing to me through the transaction. On the other hand, many practical apiarists have gladly heeded my advice, and, acting promptly, have averted disaster. A certain York State beekeeper, who a few years since, when I talked with him of this matter, ridiculed the idea of combating foul brood by the agency of Italian bees, now loses no opportunity of lauding them to the sky for this purpose, in fact, so enthusiastic has he become in this respect, that he pales my own efforts; thus, many are being converted on this point, after giving it a trial.

Many ask, "Why are the Italians more nearly exempt, than the other races?" I wish I knew, but, not knowing, I am unable to give the desired information, therefore shall leave that point for some expert investigator to determine. For our purpose, it is sufficient to know the facts as stated.

We shall consider the importance, efficiency and economy in keeping only the Italian race, when combating this disease.

IMPORTANCE

When we consider that there is no other race or variety of bees that is so nearly exempt or immune to the ravages of this disease,

* Delivered at the New England, United States and Canada Bee Inspectors' Convention at Amherst, Mass., February 7, 1912.

as the pure Italian; and that large or small apiaries of this race often pass through an epidemic of European foul brood of several years' duration almost unscathed, and furnish their owners a good profit at the same time: While contrariwise, all black and hybrid bees in the vicinity suffer heavy losses, and frequently total annihilation, we begin to realize somewhat, the important position held by these bees. There are numerous remedies and treatments recommended for the relief and cure of this malady, but where is there one that will compare with Italianization as a preventive measure before the colony has been exposed, or after treatment, to prevent reinfection?

I consider this item, Italianization, of more importance than any other one and perhaps, than *all* others combined, in the fight against this arch enemy of beekeepers.

In view of the foregoing facts, it is a pity we have not legislation making Italianization of all bees, where necessary for protection, compulsory. However, I presume such a law would be considered unconstitutional.

EFFICIENCY

We have an abundance of proof from many beekeepers, of the efficiency of this practice. They know by experience how easy it is to control and keep this disease in check, which is certainly reassuring to one who has had the destruction of his apiary and business staring him in the face. After such experience, most beekeepers feel somewhat independent, and greatly relieved of the anxiety which they formerly experienced.

In recommending the Italians, I always try to make myself understood on this point, namely; I do not claim that they are absolutely exempt from the disease, but only in the main, as a race.

Beekeepers who have their apiaries thoroughly Italianized in advance of the epidemic can scarcely realize what they have escaped by thus taking time by the forelock.

I shall repeat a statement which I have made before, that if I desired to locate an apiary in a certain locality, the presence of European foul brood there would not deter me from doing so. Given the right kind of bees and a good season, I should willingly take my chances of success.

ECONOMY

The greatest economy is derived from Italianizing in advance of the advent of the disease, then nearly everything is saved, as there is no purchasing of comb foundation, hives, frames, etc., for treatment, only the purchase price of the Italian queens, and labor of introducing, which can hardly be counted on this score, as they are worth more than their cost outside of their agency in warding off disease.

I have met beekeepers, in my inspection work, who have taken hold bravely and thoroughly treated by shaking their apiaries of black and hybrid bees, but thought to economize by omitting the introduction of the Italians, which I urged upon them as being very essential. The result was that the following spring, one-half of the treated colonies were reinfected, requiring the purchase of an additional amount of comb foundation, frames, etc. Nor is this all; a considerable amount of the surplus honey crop is sacrificed whenever a colony is shaken during a honey flow — thus, besides the extra expense incurred by treatment each season, there is an actual loss of labor and income. Where but few colonies are kept, this matter is not very important, but when the principal income is from the apiary, the difference becomes rather serious.

Of course, I do not recommend the purchase of Italian queens in large numbers if the beekeeper is so situated and experienced that he can rear them cheaper and of as good quality himself. However, this is not often the case, and some of the most extensive apiarists purchase them by the hundred from professional breeders. The price for good stock is now so low that it is far from prohibitive.

It has been reported that Italianizing has not been found to be as effectual in handling American foul brood. I have had no experience along that line, and regret that I have nothing more effectual than shaking to offer in the treatment of this disease.

SWARMING AND ITS CONTROL*

R. F. HOLTERMANN, BRANTFORD, ONT., CANADA.

In the days of long ago, yes even in more recent times and it may safely be said of many at the present time, the bees choose their own time for swarming and many a beekeeper can safely lay the shipwreck of his hopes, as a beekeeper, to his inability to control the swarming impulse in his bees and departure of his season's profits from a colony with the departure of the first swarm in the absence of its owner.

There are those who have a fair knowledge of beekeeping, they in fact know enough of beekeeping to make a moderate success of the business could they only control the swarming impulse, but as their main business does not allow them to watch for swarms during the hours that they may issue, they run the serious risk of losing them.

Again, what apiarist who has engaged in beekeeping according to old and well-known methods, when with an apiary of say one hundred colonies he has been kept busy a large portion of the swarming hours in providing for issuing swarms, or even followed them to difficult heights and places and then has managed them on the nonswarming plan, has gone back to the first system? I venture to say, speaking from personal experience, none.

In studying the control of swarming it is of necessity desirable to know the cause. The beekeeper who seeks to find the cause in any one specific thing is, in my estimation, on the wrong track. Some varieties of bees swarm more readily than others. In one hive a colony may swarm, when a larger entrance to the hive and facilities for ventilation might have prevented swarming. In another there is abundant facilities for ventilation but the hive has become crowded and the bees require room.

In still another case the queen is failing, the bees start supersede cells and when the young queen hatches the hive throws a swarm, when otherwise the impulse would not have developed.

It is now quite a number of years since I made the public

* Given at the Convention of the New York State Association of Beekeepers Societies at Syracuse, N. Y., January, 1912.

statement — a statement which has been indorsed by well-known beekeepers — that the first step toward swarming is to start drone brood. It takes longer for them to become potent for fertilization and therefore it is necessary in reproduction that the drone brood should precede the virgin queen cells. Next comes queen cell cups, then eight days before the first young queen emerges from the cells, under normal conditions, the first swarm issues.

Some years have passed since I wrote the above and I would now ask to insert another link in the chain, one preceding the drone brood, and that is, first a prosperous colony and a rapid increase in young bees and brood.

The swarming impulse may, through environments, be broken at any of the above stages except when queen cells have actually been begun. What is meant is that drone brood may mature and the hive contain drones yet the cell cups never be built. The cell cups may be built but no egg ever be deposited in them owing to conditions which may set in unfavorable to swarming, but changed conditions in the hive will rarely check the swarming impulse if queen cells have been started, although a cessation of nectar in blossoms may.

In saying this, I do not wish it to be understood that giving room to the bees in time does not have the effect of preventing the swarming impulse from developing, but that after the swarming impulse has developed, the mere adding of supers is not likely to break up that impulse.

The things which my observation leads me to believe checks the swarming impulse is first of all an abundant brood chamber. A twelve-frame Langstroth brood chamber is not too large for a queen of no better laying strain than is procurable on every hand.

Moses Quinby of your own state built better than many have given him credit for, when he planned the large brood chamber he did, and in the present step with beekeepers, generally from an eight-frame Langstroth hive to a ten, they are only paving the way to additional outlay when they find the twelve-frame hive as much better than the ten, as they are finding the ten-frame hive better than the eight.

Next, the entrance to the hive: Who among those who have traveled through the country have not seen a hive of bees with an entrance four to six inches wide or even less and the front of

the hive partially covered with bees. Such an entrance to a hive is a mistake and a loss to the beekeeper. The entrance to my hives are the full width of the inside measure of the hive, seventeen inches, and during the time of gathering surplus honey one and one-eighth inches deep.

Then as to supers: In the production of extracted honey, the bees should be given plenty of surplus room to store and ripen their honey. I have had five full depth extracting supers on a hive and practically all the room occupied with honey at the close of the flow and no swarming impulse. Who could obtain these results in a five-week clover flow from the combined surplus crop of a parent colony and a swarm?

Shade during the heat of the day is an important factor in the prevention of swarming. A row of colonies on the west side of a fence in the direct rays of the south and west sun is more liable to swarm than if the same row stood under the shelter of an apple tree with only the morning and evening sun upon the hives.

Again, a colony will often swarm, and if the queen is clipped, owing to the absence of a queen among them, the bees undertake to return to the old stand, and sometimes scatter along a row of hives and enter them. I believe these bees tend to set up the swarming impulse wherever the conditions for such are at all favorable.

Some varieties of bees are much less inclined to swarm than others. It is only a master beekeeper and a specialist who should undertake to run varieties of bees strongly inclined to swarming.

Lastly, the season: We know there are seasons during which bees are much more inclined to swarm than others. In tropical countries bees do not swarm during heavy flows but when the conditions for nectar gathering are only moderate, swarming sets in.

My observation leads me to believe that the same, to some extent at least, is true in our own land and that steady heavy flows tend to diminish swarming; erratic and changeable flows tend to increase swarming.

A large and contented colony is the foundation to successful honey production, since "In union there is strength." To keep strong colonies from the swarming impulse rather than to break it up after they have it, is the key to success.

INTRODUCING QUEENS WITH THE "WEST" CAGE *

NOAH D. WEST, MIDDLEBURG, N. Y.

Close the large end of the cage with a piece of common stick candy one and one-half inches long, and attach the cage to one side of a comb within the hive, by means of its spur. The candy stopper may be varied in length according to the length of time you wish the queen to remain caged, and may be kept from falling down in the cage by placing a nail between the coils of the cage at the lower end of the candy. One and one-half inches is the right length in most cases. The bees require about 48 hours to eat out such a piece; and at the end of this time the bees are acquainted with the queen, and are generally ready to welcome her when she leaves the cage. Virgin queens, however, are more difficult to introduce than laying ones; therefore the colonies to which they are to be introduced should be in proper condition to receive virgin queens.

First, get sticks of hard candy — that is, small enough to slip easily into the large end of the spiral cage. Cut the sticks of candy in pieces for cage-stoppers. Cut some pieces one inch long and some one and one-half inches long. I prefer candy not too highly colored. Next, have a good laying queen in the spiral cage. Then remove the tin cover and slip one of the pieces of candy into the large end of the cage, $1\frac{1}{2}$ inches down in the cage; then the top end of the candy just comes even with the top of the cage. Be sure to place a nail or a toothpick through the spiral cage just below the candy, so that, when the bees eat away the candy through the coils of the cage, and the candy becomes small in diameter, it will not fall down on the queen.

This being done, go to a hive that has a condemned queen. Open the hive and kill the queen. Before closing the hive introduce the new queen by hanging the spiral cage by its spur on the side of a comb in some place where it will be out of the way. Be careful not to press combs of honey against the cage hard enough to daub the queen with honey. The cage may be laid on top of the broodframes under a quilt, or on the hive bottom if desired.

I introduce nearly all of my queens in this way with one operation. This saves me a good deal of time and I lose but few

* Delivered at the Adirondack Beekeepers Convention at Glens Falls, N. Y.

queens. The fact is, when I see a poor queen I kill her at once, if it is in the season when I have surplus queens on hand. Then I introduce a young laying queen before closing the hive. I then mark the hive so that I know what has been done, and give it no more attention until some days later, when I am again working in said out-apiary.

I want to say a little more about the hard-candy stopper. It is very much more convenient to use than the soft candy usually made with sugar and honey. It is cleaner to handle. By the use of hard candy the apiarist can learn to gauge the time he desires his queens to be liberated.

The apiarist will soon learn how much hard candy to use and how to use it.

The hardness of the candy and the strength of the colony have something to do with the length of time required to liberate the queen, by using a piece of candy $1\frac{1}{2}$ inches long. If you set the nail through the cage for the candy to rest on, so that only $\frac{3}{4}$ -inch of the candy is covered with the cage, and $\frac{3}{4}$ -inch of the candy protrudes above the cage, then the bees will eat the same size of candy stopper away very much sooner than they would if the candy stopper were crowded down into the cage the whole length of the candy.

Queens can just as well be introduced some days after the removal of the old queen, the same as with some other cages that require soft candy; but remember to use just as much hard candy as you need to confine the queen the desired length of time.

Many will think that the bees will not eat the hard candy away and liberate the queen; but they will do it with the spiral cage.

The candy becomes softer after being covered with bees, and they eat it away faster than you would think. They eat it from all sides through the cage until the candy is so small that the bees go into the cage with the queen before she walks out. The bees never kill the queen in the cage.

In due time the queen walks out of the cage quietly. She is now safely introduced.

It is better not to open the hive for the next few days after the introduction of a new queen.

Many queens are killed by opening the hive too soon after they have been safely introduced, before they begin laying freely.

WHICH IS THE MOST PROFITABLE, THE PRODUCTION OF COMB OR EXTRACTED HONEY?*

GEORGE B. HOWE, BLACK RIVER, N. Y.

At first thought most beekeepers would say this would hardly be a fair question. I shall do my best to explain why I changed from comb to extracted honey after producing comb honey by the ton for years, and having such men as Mr. F. H. Loucks compliment me as one of the best comb-honey producers of the state. Mr. Loucks said at one of our conventions that he could not understand why, at that time, I should make a change, when others were taking up comb-honey production and most of the bee journals and even the Department of Agriculture at Washington were urging beekeepers to produce comb honey, as there surely would be a shortage.

Let us take up this matter thoroughly. Taking the price of comb and extracted honey for the past few years, I find that the prices of extracted honey have kept abreast with those of comb honey as they have advanced, and in some sections are in the lead of comb honey prices.

A prominent beekeeper told me several years ago that I was making a mistake, that I should produce extracted honey; so I decided to experiment. I took the colonies that were not strong enough to produce comb honey and to my surprise they made more pounds of this kind than the stronger did of comb honey. I had been told this before, but I figured that if such weak colonies did so well what would the stronger colonies do. Consequently I set aside a yard and ran it for extracted honey exclusively. This proved what my friend had told me—I was losing money producing comb honey.

Lest you get the wrong impression let me explain why I obtained these results. Our honey flow is from clover and bass wood; there was no dark honey to speak of. Most years bass wood fails to yield us any honey, and this being the case we have a short flow, which leaves even the expert with too many unfin-

* Given at the New York State Beekeepers' Association Meeting at Syracuse, January, 1912.

ished sections on his hands. If there is a long honey flow that can be depended on, it would pay some beekeepers better to produce comb honey. There is always a ready market, or has been for the past few years, for good comb honey.

We will take the price paid for fancy and No. 1 comb honey in 1912 which was fourteen cents a pound delivered in New York City. You must figure your time setting up your sections and putting in your foundation comb; also the cost of your section boxes and foundation, shipping cases and carriers, with freight. You will do well if this does not cost you above four cents a pound. That will leave you ten cents a pound for your comb honey.

Good extracted honey can be bought at eight cents a pound wholesale and eleven cents retail. Some, I will admit, receive more than this and so did others with their comb honey. Even so, I can produce from one-half to double the amount of extracted honey that I can comb. Since the pure food law went into effect, I sell ten pounds of extracted honey to one of comb — that is to my home trade. And since I sell from two to five tons a year you can see why I made the change.

Also, we can care for more bees and keep our honey if properly ripened on the hives and properly put up, as long as we want to, but with comb honey, you must get it on the market in time and in first class shape to get the best prices.

We should supply our home market first; many beekeepers are losing money every year by not doing so. Do not be afraid to ask any of your neighbors if they want some fine honey. After that they will ask you and even come after it. It is a pity that so many people go without honey because the beekeepers do not advertise their product as do other producers of food products. The farmers are my best customers. They buy in large quantities and pay cash.

Let us be as neat and clean as possible, asking anyone in to see us extract the honey. Let them sample it, and the old hoax of manufactured honey will soon die out in your locality.

THE PRODUCTION OF EXTRACTED HONEY*

R. H. HOLTERMANN, BRANTFORD, ONTARIO, CANADA.

In the successful management of bees we may well draw a circle and begin at the desired point and by the time we reach the completion of the story we shall reach the point at which we began. For the successful production of either extracted or comb honey, the proper wintering of the bees is an important factor.

For many years I made a practice of wintering bees in the cellar, which consisted of a building well constructed and especially designed for the purpose — costing \$1,000.

For three seasons, however, all of my bees have been wintered outside; four colonies being placed in outer cases packed with forest leaves and a fence eight feet high being put about an apiary forty to fifty feet long and of the same width, and I am of the opinion that there are many beekeepers at present wintering their bees in cellars who could winter them with success outdoors. In outside wintering one can leave them earlier in the fall of the year and return to them later in the spring, and they require less care outside than in the cellar. The bees will also be packed and protected during the spring when those wintered in the cellar often suffer from cold and backward weather, after they have been placed on their summer stands, and for that short time it does not pay, or at least it is not considered that it pays, to pack them.

I have adopted a twelve-frame Langstroth hive and to such an extent am I an advocate of this hive that last season I took over one hundred colonies out of ten-frame Langstroth hives and put them in the twelve-frame. By adopting this hive in almost every case the brood can all be put into one hive body; this entails much less work than if two bodies contain brood.

The bees I prefer to all others are Carniolans. Give them plenty of entrance room, ventilation, shade and storage room and swarming can be controlled, but after carefully weighing all the evidences from reliable sources I have reluctantly come to the

* Given at New York State Beekeepers' Convention, Rochester, N. Y., December 1912.

conclusion that these bees may be more susceptible to European foul brood than the average Italian.

In the production of extracted honey I use a queen excluder between the brood chamber and the supers. At the beginning of the honey flow the first super, a twelve frame with only ten combs spread, is put upon the hive, the hives having previously been taken out of the outer cases. When the bees begin to cap honey in this first super, or even a little sooner, if the prospects are good, I put on a second super, putting half the partly filled combs in each super and one set of these combs immediately above the other, filling the other half of each super with empty combs. Placing the combs in this way makes the break to the bees less violent, and in my estimation, gives more satisfactory results. In this way the honey is tiered up during the entire white honey flow.

The combs in the brood chamber are carefully gone through each week, the majority of the bees being shaken from the combs to facilitate examination for queen cells, and if any are found, judged to be from the swarming impulse, they are broken down to prevent swarming.

The honey is taken off, and the bees brushed from both sides of the comb by one operation, the one who does this work holding a brush in each hand. I personally remove the honey from the hive, shaking the bees very largely from the comb; after which it is brushed.

The honey is placed in supers; nine or twelve being piled in a light spring wagon and taken to the extracting house. A twelve-frame reversible power extractor, run by means of a gasoline engine, extracts the honey, a pump carrying the latter, after coarse straining, into tanks six feet high by three feet in diameter. I have eighteen of these tanks with a tight cover and honey gate, and I like this method of caring for the honey so well that six more have been ordered for the coming season. They hold 3,000 pounds or more each.

The coarsest wax, etc., having been strained out, the balance rises to the top of the tank and in a few days time is skimmed off. The honey is then ready to be put into the vessels in which it is to be sold.



FIG. 96. R. F. Holtermann

Practically no honey is extracted from the brood chamber. If there is no robbing, the empty combs are put upon the hives as soon as empty; otherwise they are kept in the extracting house until the latest moment in the day that I consider it possible to return them all before twilight.

In closing, let me point out that very pungent smoke should not be used when removing combs to extract. Its use tends to give a smoky taste to any uncapped honey, or at least taints the honey which drains from the cappings, and for that reason should be avoided.

MARKETING EXTRACTED HONEY *

GEORGE B. HOWE, BLACK RIVER, N. Y.

The selling of extracted honey like that of many other commodities, is a trade by itself. Extracted honey is one of the articles of diet not generally called for, but must ever be kept before the public and given a sightly place on the shelves or counters. Other articles of this class are thoroughly advertised, which tends to keep the public thinking, and once the attention is turned toward honey, it is usually comparatively easy to make a sale.

First, your honey must merit or your trade will be short lived. What I mean by merit is that it must be of good flavor, possessed of a heavy body and fairly well colored. Extracted honey that is not cured by the bees will not hold trade. If you are determined to produce that kind of honey, you will be obliged to look up new customers each season.

Honey cured by hot air and ventilation has lost its most delicate qualities — that something which tickles the palate and makes a customer for all time. There is but one trade that will take this class of honey regularly and that is the baking trade, and of course at a lower price. In fact I can not imagine what would become of us as beekeepers without the baking trade, for this is where we dispose of the lower grades.

But as to the table trade, the people who eat the honey and who pay a higher price, how are we to reach them? I should say that would depend on conditions and circumstances. To bottle honey and do it economically one must have quite an outfit or the expense is too great. I am convinced that one-half of the people who bottle are doing it at a loss.

If a man is naturally a good salesman and he has time and inclination, I should advise him to sell his own honey; but few people are so qualified. A salesman must be able to talk freely on any phase of the business which he represents. He must be able to read from the face and general deportment of his would-be

* Delivered at Watertown Bee Keepers' Institute.

buyer what the buyer is thinking, so as to be able to meet any objections or questions he may bring forth. This ability in a salesman gives him great advantage, since he can judge how to present his case in the most taking manner to the particular individual with whom he is talking. There is a difference between selling honey and giving it away. I know of producers who are canning their honey and putting it on the market in such a way that it is not bringing them to exceed seven cents per pound and that to the retail trade. I suppose these people have never figured what they were really getting for their money. This same honey would have been taken by the jobbing trade at seven and one-half cents in large lots and save the producer all his time and trouble.

This class of beekeepers would be doing the craft a kindness as well as themselves to sell to the jobber, because transacting business in this way is demoralizing to the trade and has a tendency to lower prices, which should be avoided. The price of honey can not be raised but let us see that it goes no lower.

Then there is a class who are salesmen. I have personally known several of these who dispose of their crop by peddling to the farmers. Why the farmer? Because as a rule the farmer buys a quantity at a time,—ten, fifteen or twenty pounds, while the village or city family would want to buy only a pound, pint or quart. It takes just as long to sell the small quantity to the villager as the larger to the farmer, also the city and village always have honey in sight, while the farmer buys because his attention is called to it.

The groceryman is harder to sell to because he has several avenues open to him from which he can get honey. If he does not like you or your goods he will quickly let you know such is the case. However, if you are not a good salesman or have other remunerative work, the groceryman is the natural channel for disposing of your honey crop.

In conclusion, I would urge beekeepers to look at the selling of his crop in a business way. Dismiss all enmity for your neighbor beekeeper. Such enmity has prompted many to cut prices year after year until the local trade is ruined or demoralized to a point where there is no profit in it. If you bottle your honey, figure your time worth something and add it to the jobbing price along

with the cost of the bottles, labels, etc. Just as soon as you cut prices you will suffer the results. Produce and offer for sale only the best and have it cured by the bees.

In handling your honey as I have recommended, you will increase the interests of beekeepers in general and will enhance the beekeeping industry in this state.

COMBINING BEEKEEPING AND FARMING *

JEROME R. SNYDER, WAWARSING, N. Y.

The subject I am about to discuss, "combining beekeeping and farming," is a broad and debatable one. We are living in an age of specialism. If any of us were having eye or ear trouble, we would not go to our old family physician for treatment, but would locate some eye or ear specialist. I believe in specialism in beekeeping as well as in any other industry.

The time may come when the income from our apiary is not enough to meet our needs or maintain us as we would care to live. What must be done? The specialist will say "keep more bees, keep better bees." That is all very good. We begin to consider some plans to keep more bees. From past experience we are sure we have as many in our home apiaries as the surrounding country will afford profitable pasturage.

The next thing to do is to start out to look for an outside apiary. After some driving around the country we find a location. It is from five to fifteen miles from home, which necessitates running a business in two sections that distance apart. Now the question arises, "Which would be better, to start this out apiary, which necessarily brings part of your work some miles from home; or combine your beekeeping with farming?" To my mind it can successfully be combined with farming or with special farming such as poultry, small fruit or berries.

The general farmer could plant such crops as buckwheat, alsike clover, etc. That would give pasturage for the bees and the bees in return would be a help to the growing crops and fruit by pollenizing the blossoms.

The combination is an advantage when we encounter unfavorable seasons. I think the first and most careful consideration in this combination is the "man behind the gun." If one finds that he cannot apply himself to the study of different subjects without

* Delivered at the Eastern New York Beekeepers' Association Convention at Kingston, N. Y., 1912.

one interfering with the other, do not combine anything with beekeeping or beekeeping with anything else.

The successful farmer to-day is not the old type of forty years ago. To succeed to-day he must study his farm as carefully as the manufacturer studies his factory or the merchant his store.

My conclusion is this — if a man is a successful farmer he can combine beekeeping and farming, and make a success of both. If he is not a successful farmer he has troubles enough without multiplying them by adding beekeeping to his responsibilities.

BEEKEEPING AS A SIDE-ISSUE IN THE PROFESSION*

REVEREND ISAAC V LOBDELL, TROY, N. Y.

Father was a beekeeper before I was born. When old enough I became his assistant, helping in the shop and yard. My work was largely in the former, however, and consisted in the usual routine work of folding sections, filling them with foundation, preparing supers for the hive, cleaning honey, etc.

One day I was called from play to help hive a swarm of bees; being barefooted, I put on a pair of father's rubber boots for protection. As the swarm was shaken from the limb to which it had clustered, a good-sized bunch missed the pan held to catch them, dropped down the inside of those boots and mingled with a pair of bare feet. My interest in bees immediately became an all-absorbing passion. I dare say no boy ever relieved his feet of a pair of boots, or made a "get away" for a hundred yard dash more quickly than that barefooted assistant. Perhaps the incident had something to do with my youthful preference for the shop end of beekeeping. Interest in the work of the apiary came, however, in due time.

On my return from college one summer, father gave me three of his strongest and best colonies; this, with a larger share of responsibility in the care of the apiary, brought on an incurable case of real bee fever.

Now I am a minister with a hobby — beekeeping. On my first charge, in the hours spent in my little apiary, I courted good health and made my escape from the worries and anxieties that inevitably beset the path of the young minister.

At present I have about sixty colonies on my father's place, thirty miles from Troy. When I go home for a day or two I find joy in caring for my bees and here I spend July and August, returning to my parish, tanned, optimistic, full of hope and ready for the work before me. Nothing can surpass beekeeping as a side-issue in the profession, and few things equal it.

First. It promotes health. The busy man too often neglects

* Given at Eastern New York Beekeepers' Convention at Albany, N. Y., December, 1912.

proper physical exercise, health fails and a breakdown results. The mind is most active when the body is strong and vigorous. The duties of professional life are exacting and very exhausting, therefore every man should have a side-issue or hobby that will make him forget his cares and worries, take him into the sunshine and fresh air and restore his vigor of body and mind. The blood must flow swiftly if one is to reap success and find joy in the work.

Some, according to personal inclination, turn to fishing, hunting, golf, etc., for recreation and health, others to a different kind of work, as, for instance, the business man to his farm, the office man, clerk, teacher and many professional men to their poultry, garden and fruit, and still others to their bees. Not idleness, but change of work and interests bring rest and health.

Lift the cover of a hive and study the life of that busy, hustling community, see the bees drop before their homes, laden with pollen and honey; follow their winged flight to the fields of flowers, sweet with nectar, and you will be under such a hypnotic spell that the sense of time, and all worries and cares vanish as the dew. Beekeeping is one of the most fascinating of all occupations and pays big dividends in health and pleasure.

Second. Beekeeping is light, clean work and one may keep as few or as many colonies as time, inclination and ability permit. Many women keep bees and do all the work required. There is little or no heavy work in connection with keeping a few bees and much of it can be done, if careful, without stopping to put on old clothes or overalls.

Men living in thickly settled communities can readily keep from one to a dozen colonies on the roof or in the back yard of their homes, caring for them in spare moments. Those living in the country and more favorably situated as regards room and time could care for a much larger number.

Third. Beekeeping is a side-issue, a hobby, a sport, that pays dividends, not only in pleasure and health, but also in cash. One or two colonies of bees will supply your table with honey, and if you keep a few more colonies, friends will be glad to help you dispose of your surplus or it can be sold at a good profit.

The financial returns from beekeeping will depend upon the number of colonies, the kind of season, and the skill of the bee-

keeper. If located in a good honey section, with an apiary of fifty to a hundred colonies, beekeeping as a side-issue should prove helpful in providing for the rainy day or make possible pleasures otherwise denied.

Beekeeping is full of potentialities for the professional man and especially for the minister in charge of a rural church. The rural church problem is a vital and pressing one. The scope of church work is enlarging and methods are changing. The country minister must know the problems of the community, he must understand the "rural mind;" he must be a leader in the fight for economic as well as for social and spiritual salvation. The minister that spends all his time in his study with his books and in making professional parish calls will never get the "rural view point." That knowledge comes from sharing a common lot, manual labor and contact with the soil.

Beekeeping will give the minister a point of contact with the work-a-day life of the community. Able to stand forth, a skilled laborer, he will command a greater faith and a larger hearing among others that labor.

The country parish offers great opportunities for service, but it is a service that does not yield great financial returns, in very many instances not even a fair living. Facing such conditions, the value of beekeeping as a side-issue becomes self-evident. I dare say that many ministers having acquired experience and skill, by properly systematizing the work of parish and apiary, could, without destroying their professional efficiency, keep from one to two hundred colonies, and those colonies would help tremendously in making ends a little more than meet.

Mr. Beekeeper, for pleasure, health, and for the sake of his pocket-book, urge your minister to keep a few bees, and he in turn will work out with you more efficient methods, and help you to establish beekeeping as one of the most skilled and desirable of agricultural pursuits.

AN EASY WAY TO RAISE A FEW OR MANY GOOD QUEENS*

H. L. CASE, CANANDAIGUA, N. Y.

Take an empty brood comb that has had brood in it once or twice and place it in the center of the colony containing the queen from which you desire to breed. If this is at the time of year when the queens are laying to their full capacity take the card out and examine it on the fifth day after placing it. Should the larvae and eggs extend two-thirds across the card it is ready for use; if they do not, replace it in the colony and it will be ready the next day. When taking out the card for preparation be sure that you keep it warm and do not allow it to become chilled. If the day is warm it will not chill, but do not leave it exposed to the hot rays of the sun. Should it be a cool or cold day, use artificial heat and take it into a warm room for preparation.

Lay the card down on a table, and beginning at the lower edge of the brood patch, mark the comb with a sharp knife lengthwise of the frame in rows containing a row of one cell and a row of two cells alternately, cutting to the midrib. With a sharp chisel shave off the cells from the two-cell rows down to the midrib; then you have the one-cell rows left.

Be sure to destroy all the eggs and larvae where you have shaved off the comb, a match is good for this purpose. Then commence at the end of the row of cells left standing and leave the first egg or larva and destroy the next two, leave the next and destroy the next two and so all over the card.

Next, take an empty super and drive three eight d nails on the inside of the super one in each end and one on each side about two and a half inches from the bottom. These are to lay your prepared rack on with the prepared cells pointing down. The cells are to be raised only on the prepared side of this card, the eggs and larvae on the other side of the card are not to be disturbed. Lay the card on the nails driven inside of the super and cover up the top of the rack as it lays in the super with a good warm blanket, letting the blanket come right down tight to the comb.

* Delivered at the New York State Beekeepers' Association, Syracuse, N. Y., January, 1912.

Your card is now ready for the bees to perfect the cells. Next select a strong colony full of brood and young bees and remove the queen and all the brood, placing the brood and queen into another hive. Fill the hive with empty combs or sheets of foundation or starters. Be sure if there is no honey coming in, that a card of honey is given them, also that they are fed honey or syrup liberally three or four times while they are building the cells.

If you have a place to use this brood and queen shake the bees off of it; if you wish to make an extra colony of it or return the brood and queen to the colony after they have perfected the cells, you must leave enough of the adhering bees to take care of the brood.

Now place your super with this prepared card on the broodless and queenless colony the same as you would for surplus honey. The cells will be ready to use the eleventh and not later than the twelfth day after putting the super on. When you go to take the cells out to use remove the quilt, raise one end of the rack carefully, blow in a little smoke under it and you will find the space in the hive between the rack and the top of the frames full of bees. Blow a little smoke on them to drive them back off the rack into the hive. Then you can remove the rack, and with a bee brush, brush most of the adhering bees off, being careful not to hit the cells with the brush. Keep the rack right side up as much as possible with the cells pointing down, and carry to some suitable place to cut out the cells.

The cells in the center where the larvae were located will be in advance of those on the outside. The ripe cells may be distinguished by the bees having gnawed the ends of the cells. Should there be enough of these for a day's use, remove them carefully by cutting clear through the comb and return the card to the cell building colony again.

Now the cells can be used by putting them into nuclei or they can be used for requeening new colonies where the old queen has been removed the day before. Use a cell protector in either instance leaving this comb as the base of the cell. Always handle the cell by this base, being careful never to touch the end of the cell.

In two days the cells which were returned to the colony will be ready for use. If there are any small or inferior cells, which is apt to be the case where they raise a large number, they can be destroyed.

Now if you have not disposed of the brood and queen, which you took away from the cell building colony, it can be put back or united as it originally was, only the queen will have to be introduced the same as a strange queen. If you have disposed of the brood and queen in other ways, they must have a card or two of brood and another queen.

If you want to raise another batch of cells raise them on another colony; never use the same one twice. The queen will lay in a clean comb sooner than she will in a dirty one. If you raise the cells during the honey harvest, the queen will lay faster than she would if you raised these when she was not laying to her full capacity. You must use your judgment in regard to these matters.

One of the great advantages of this plan, over other plans, is that the nurse bees can spend all their energy on these cells, having to care for no other brood. Another is that you are sure of perfect queens because they have no larvae too old to raise queens from. If you want to raise but a few cells do not leave the card so long in the breeding colony.

There has been over a hundred cells raised on a single card at one time. If you want to raise good, prolific queens you must observe these cautions strictly.

BEEKEEPING AS AN AVOCATION FOR WOMEN*

HETTIE E. HOFFMAN, CANAJOHARIE, N. Y.

Some time ago I heard a man remark, "There is no occupation under the sun where women do not crowd in now-a-days." The man was mistaken. Women are not crowding in, they have long arrived and taken their place side by side with men, efficiently helping along with life's work. In one respect the man was right; there is hardly an occupation under the sun with which women have not or are not trying their luck. Beekeeping is one of the many. How far back there have been women beekeepers, or how many there may be now, I could not tell; but I know that bees can be kept by women as successfully, both financially and otherwise, as by men.

There has been much nonsense written in papers about a veilless and gloveless, as well as laborless, lucrative beekeeping for women, children and invalids. Bees can be worked without veil or gloves, I admit, but the woman who embarks in beekeeping with an idea of taking her fancy-work into the apiary and sitting contentedly watching her bees gather the honey for her, will soon conclude that if she wishes to realize the profit from them she is anticipating; she would better don veil and gloves and do some honest work; do it when her interests demand it, and not only at times when the bees happen to be in the mood to be worked without antagonism.

When I was requested to write this paper on "beekeeping for women," I found the only thing I could tell was my own experience as a woman beekeeper; this I have endeavored to do without any attempt at rose-coloring or discouragement.

When my father died, several years ago, mother and I suddenly found ourselves with 225 colonies of bees on our hands, the principal care of which depended on me. Although an experienced beekeeper's daughter, I was disgracefully ignorant of the proper management of bees. Father had always had help to work his bees, and the honey-house work had been my share. I

* Delivered at a Bee-Keeper's Institute at Utica, N. Y.



FIG. 97. Miss Hettie E. Hoffman

went near them as little as possible, as I was about as fearful of a bee sting as of a snake bite. With the exception of a few times when I had gone out with father to smoke the bees for him and do a little handling, I had never ventured into the beeyards.

The first thing I did was to get a pair of good, safe rubber gloves. They were so stiff my hands felt as if they were done up in splints, and gave me more discomfort than a goodly number of bee stings would have done. Fortunately they did not last long, they soon began to split and break. I have since found a thin leather, or light canvas glove is best suited for the work.

The spring of 1907 was late and generally unfavorable for bees in our locality. Spring dwindling had reduced our number of colonies to about 200. Of these we moved 80 to an out-apiary on May 24. Apple trees were then just beginning to blossom, and the bees by this time having become alarmingly light of stores, literally filled up during the bloom.

Some time later when I went to work this out-apiary, the first thing that greeted me on my arrival was an immense swarm of bees high up in an apple tree. While I was lighting up the smoker and getting ready for work, another swarm came tumbling out. I hurried to look for the queen, and back of me came another, and still another. The whole air seemed filled with swarms. I felt like swarming out, too, and leaving the bees to their own sweet will. I found consolation, however, in the knowledge that I had faithfully clipped every queen's wings early in the spring, and that they could not get away from me no matter how hard they tried. I had read in a bee book that it takes sixteen days for a queen to hatch from the day the egg was laid. On this I relied. I went through my bees and assiduously ripped out not only the queen-cell, but every queen-cell cup that had anything in it resembling an egg. When on the twelfth or thirteenth day after this I again visited the beeyard, confident that I was getting around in plenty of time, I was painfully surprised to find many young queens hatched. More swarms had taken to the woods or filled neighbors' dry-goods boxes than I should like to tell. I indignantly concluded that there was something entirely wrong and misleading about those bee books. Had I perused more carefully I would also have read that when bees have larvae they will rear a queen in ten days.

The first summer was hard, and we made many mistakes. To make matters worse it was a poor season in our locality, owing to the extremely late spring and succeeding severe drouth. From our 200 colonies we harvested slightly over 6,000 pounds of comb honey, and about 2,000 pounds of extracted.

The season of 1908 again proved a poor one, owing to the same conditions of drouth as in the previous summer. But 1909, however, gave us a good crop of fine-quality honey.

I found that 200 or more colonies were more than I could properly manage with numerous other duties depending upon me, so we gradually reduced our number to about 170. From these we harvested, the past season, 11,500 pounds of comb honey, and about 2,200 pounds of extracted.

The work in producing these crops was all done by women, with the exception of putting the bees in and out of their winter quarters, moving them to and from the out-apiary, and drawing the honey to the freight house when it was ready for shipment. For this work we hire men from the neighborhood.

Mother and I make all our supplies, including comb foundation, and we do the extracting. My only help in working the bees is my sister, during the two months she is with us. A 15-year-old niece assisted with the finishing of the sections the past season.

Beekeeping for women, although a healthy, and for the most part pleasant occupation, is by no means all easy work. To carry tons of honey from the hives into your honey house, or bend all day over bee hives, handling and shaking heavy combs, would soon scatter illusions to the winds, and probably end in prosaic backache and kindred complications for a woman not accustomed to strenuous work. For a woman to plunge into beekeeping with the hope of at once deriving a competent income from it would, in most cases, end in discouragement and failure. If, however, she is content to begin with a few colonies, and study the habits and management of her bees before she ventures deep, she will in time find it a remunerative business. She will also find her endurance growing with her colonies, for cultured woman is but the weaker sex because for centuries she has pampered herself, and allowed herself to be pampered. The peasant women of Europe who go into the fields and work,

shoulder to shoulder with their men, are as strong as men, and the women of savage tribes are fully capable of performing the burden of the work thrust upon them. The practice of wheeling a wheelbarrow to and from the beeyard is better exercise for gaining health and strength than swinging dumb-bells or subjecting the body to various contortions in physical-culture practice.

Remuneratively compared with other occupations, beekeeping has its advantages as well as its disadvantages. A woman, able to work, can successfully handle from 125 to 150 colonies of bees with but little extra help. In a fair season, if properly worked, they will net her an income quite a little ahead of her sister who teaches, or works in factory or store. But to the beekeeper every year does not bring a good crop. The season for the actual honey flow is comparatively short, and if during these few weeks the weather is unfavorable, or as is sometimes the case, the blossoms yield little or no nectar, the crop will be short, or even a total failure, manage or work as faithfully as you will. Then there is capital invested, and the responsibility and risk of ownership, the burden of which the employer carries for the woman working for wages. But, while for the wage earner, in most cases, it is an all-year-around monotonous performance, for the beekeepers, after a summer of outdoor life comes a period of rest. While your bees are taking their long winter sleep they need little if any attention. Certainly the wise beekeeper will get ready as many supplies during the winter months as possible, if he or she does not wish to be caught in a summer rush that is anything but pleasant. Even this working ahead will leave plenty of time for rest and recreation.

The woman who keeps bees lives and works at home, and can attend to her household and family duties besides her bee work, even though some minor details may be neglected during the busy season. There is much easy, agreeable work connected with the business that will keep the growing boy or girl out of mischief.

There is always a ready market for good honey. Dealers are usually looking for comb honey put up in neat, attractive packages, and properly graded. This work is especially adapted to women. The best way to dispose of a crop of comb honey is to ship it as early as it can be gotten ready for the market. Sell it

outright for cash, if possible; if not, ship it to a reliable commission-house. Nearly all our extracted honey is sold at home. This honey is put up in five and ten-pound pails as soon as extracted, and allowed to granulate. The labels on our pails tell our customers that pure honey will granulate; they also give directions to liquefy the honey if so wanted, and we have yet to hear of a complaint of "sugared honey."

The woman keeping bees can, if she will or must, do all her own work. A woman cannot very well farm it alone. She must hire men to do the heavy work, and by so doing she becomes dependent.

While beekeeping is not a "get-rich-quick" business, and probably never will put man or woman in "millionaires' row," it will provide a comfortable income for the right man or woman. It is an interesting, ever new and broadening study, bringing one close to nature, and for the beekeeper the everyday life easily becomes the ideal simple life.

BEEKEEPING FOR WOMEN *

MRS. C. D. MINER, LIMA, N. Y.

Sometimes I wonder if many women know what a delightful and healthful occupation beekeeping is for a woman. In these days, when so many women must be bread winners, why do not more of them take up outdoor work, as it means so much in the way of fresh air and sunshine, better appetite and sound and refreshing sleep, which we know bring good health and a sunny disposition.

No woman who is nervous and ailing most of the time can make the happy home all good men and women crave and so few have. I would have my sisters get out in the sunshine, become interested in the honey bees and learn to know and love them as I have.

Do you know that each individual hive is a distinct family with its needs just like a human family? If you become acquainted with them, find out how to supply their needs, they will thrive and give you a nice surplus of honey. If you feel that you must work in shop or store, in the schoolroom or even in your own kitchen eight or ten hours per day, get a swarm of bees, put them in your back yard or even the attic by an open window where they will not be disturbed; then in your leisure time learn to know them. They will soon become a rest and refreshment to you, taking your mind entirely away from the trials and vexations of the day.

If you wished to learn a new embroidery stitch, or how to successfully fire your hand painted china, or the latest kink in cake making, you would study. Go out of doors, study the honey bees. You will find excellent text books on the subject and the kindest of friends among the apiarists to help you get started.

Beekeeping is like the study of music, you never get to the end. There is always something new and interesting to learn. Any day you may be called upon to use all the common sense, tact and perseverance you possess, in the care of your bees, but it will pay, not only in good health, but in a fat pocket-book.

*Address delivered at the Monroe County Beekeepers' Convention and Institute, at Rochester, N. Y., March 7, 1912.

WINTERING BEES IN THE CELLAR*

N. D. WEST, MIDDLEBURG, N. Y.

The one most essential point for the successful wintering of bees is to have a good colony of bees to begin with; a colony of bees in a good hive, with a goodly number of young bees that have been reared late in the season, so that they have not worked out half of their life before the winter begins.

See that they have 25 or 30 pounds of good honey in their hives, and about the middle of November carry them into the cellar. Properly place them according to the number of colonies you have to winter, and the size of the room that you have for them. If the ventilation is right, and the temperature from 40 to 45 degrees above zero, the bees are as sure to winter well as are other live stock on the farm.

A few days before I put my bees into the cellar, I weigh each hive with a pair of hanging spring scales that will weigh one hundred pounds or more. I use a little lever device to hang the scales on, and with a pair of hooks properly made, the hives are easily lifted and quickly weighed. I mark the weight of each hive on a tag tacked on the front of it.

When all the hives are weighed, those having less than 25 pounds of honey, are supplied by giving them extra combs of honey that I have on hand, or by exchanging combs with those hives that have honey to spare. If I have not sufficient honey in the combs to winter the whole apiary, I feed sugar syrup to make up for the deficiency. It costs me more to feed syrup than it does to have the bees store their own honey in their combs as they gather it from the fields, for winter use.

The changing of combs should be avoided as much as possible in apiaries that have traces of "foul brood."

If there are any nuclei that need uniting, I unite them on a cold, frosty morning in the fall of the year, and see to it that they have bees and honey enough for a good swarm. The bees thus treated will not fight, and will winter as well as the rest.

* Given at the Eastern New York Beekeepers' Convention, at Albany, N. Y.

To further prepare for wintering the bees, I build a platform in the cellar about eight inches high, as wide as the hives are long, or a little scant, and about four inches from the cellar wall. I pile my hives four or five hives high, and have the back end of each two inches higher than the front. This will cause any water that might accumulate in the hive to run out; and will also give the bees a better chance to get their dead out of the way. This arrangement applies only where fast-bottomed hives are used. When hives without bottoms are employed the bees will winter just as well by piling the hives level, except that a stick one inch square on top should be put at each end of the hive. Set the next hive on that, and so on. I leave a space to walk between each row of hives in the cellar.

I have most of my hives fitted with fast covers and bottoms when transporting them into the cellar, and close the entrance to the hives so that no bees can escape. I draw the most of them to the cellar way on a wagon, and then run them down a chute into the cellar. I know of a beekeeper who piles them up while two other men go after another load. Any available help can do this.

When all of the bees are in the cellar, I light up a large-sized smoker and smoke the cellar full of smoke. In about three moments later, I open the entrance to all of the hives; the smoke will keep the bees from rushing out when the entrances are removed. I give a ventilation a half-inch high, and clear across the front end of my hive.

Most of the cellars under dwellings are used for other purposes also. In this case the opening and closing of the doors by members of the family furnish all of the ventilation that is needed for the bees. It is well to have some kind of a partition put up between the vegetable room and the place where the bees are kept, so that the lamp light used by members of the family in getting their vegetables will not disturb the bees; especially toward spring when they begin to get uneasy. If the bees do grow uneasy, the outside cellar door may be opened cool nights to cool them off, except when the south wind blows.

Some cellars are dry and warm, while others are damp and cold. Some have running water through them, and yet are not damp cellars, such as would cause things to mold. We must learn how

to winter our bees in the particular cellar we use. Learn when it is best to use quilts, or boards over the brood hive, etc. The best cellar that I winter bees in has water running freely in a ditch just outside of where the bees are located, and it runs on three sides of the space used for them. In this cellar the bees will remain quiet until late in the spring — I once kept them in until May first. I usually prefer setting bees out early in the spring but not always. This is the most delicate time of the beekeeping business, since we do not know just what the weather is going to be. If I can get my bees out quite early, and they get a good cleansing flight, without wasting bees very much, I feel sure that I have wintered them well. I then prefer to have the weather keep cool for two weeks, so that the bees will not fly very much, because after the bees have had a day or two of good cleansing flight, the queen begins to lay eggs quite freely. We need these old bees in the hive to care for the early brood. When the old bees begin to fly out freely every day, they die off very fast, but if we have the young bees and brood coming on to take their places, we will have stronger colonies by May 15 than if we had set our bees out so late in the spring that they could fly every day and gather honey and pollen. There are some exceptions to this rule.

After the bees are set out on their summer stands, I like to walk out into the apiary, some sunshiny day when the bees begin to fly out in a natural way, and watch them for a time to see that there is a goodly number of bees flying from each hive and that the entrances are clear of dead bees. Then I look at the tag on the hive to see how much honey they had last fall. If I feel sure that they have enough honey and plenty of flying bees, I just let them alone. I do not open many hives in early spring, if they have been well tended in the fall and have wintered well. I do not unite weak swarms very much in the spring of the year; most of my uniting of colonies is done in the fall. I unite bees as I please during the summer to carry out desired notions. I winter 70 colonies in the chaff-packed hives, out of doors. Sometimes they winter as well or even better than those wintered in the cellars; but on the whole, I consider cellar wintering the safest, cheapest, and best mode of wintering bees in this climate.

WAX PRODUCTION*

CHARLES STEWART, JOHNSTOWN, N. Y.

Wax has played an important part in the arts and sciences in past ages, but beeswax from its peculiar qualities seems to be preferred to either vegetable or mineral wax, and was regarded by those who kept bees as an important item on the cash account. It is now regarded by up-to-date apiarists more in the light of a by-product from the fact that it pays better to run the bees for honey than wax except in the Hawaiian Islands where they found it profitable to use the very cheap grade of sweets gathered by the bees for that purpose.

It was once thought that the pollen gathered by the bee was converted into wax but later it was proven that it was unnecessary to its production.

In fact the bees gorge themselves with honey and cluster in the hive until the wax exudes in delicate scales from the under side of the abdomen, after which it is made into comb. Later from this comb is obtained the beeswax of commerce, and the writer looks back over forty years of experience along this line to secure the maximum amount of wax.

The early methods of rendering wax by boiling the combs in a sack in a kettle of water and applying pressure after melting was wasteful and was succeeded by various devices using steam, which secured 70 to 80 per cent. of the wax. Still too much to lose but not so much loss as by the old method of building a fire around a large iron kettle and boiling the combs in this manner, when a very large amount of the wax was lost by burning on the sides of the kettle.

Finally some genius thought of the method of cider making and built up layers of comb in burlap sacks with slatted wire cloth between each layer. These were placed in a large, strong galvanized tank with plenty of water on the stove and heat applied. After the mass had become thoroughly heated, a powerful screw pressure was applied and the wax rising was drawn off.

* Given at the Fulton-Montgomery Counties Beekeepers' Convention, at Amsterdam, N. Y.

Up to the present writing this method seems to give the best results, although the writer found that after all wax had apparently been recovered from the mass a very good percentage could be obtained by allowing the fire to die down and the mass gradually cool which seems to allow the remaining wax to rise.

The wax recovered from old combs by this method is of a dark color and should be melted in clean water to cleanse it as well as to lighten its color, always being careful not to use an iron vessel, as it will stain the wax a dark shade.

Steam may be used in connection with wax rendering by heating the water, but care should be taken not to bring too much steam on the wax or it will cause it to granulate, when it is no easy matter to cast it into solid cakes unless it be run through a solar wax extractor which is a fine thing, especially in an out apiary where waste combs can be placed in it as gathered and the sun does the rest. This is not an economical way of rendering, and the residue should be saved for the hot water and pressure system.

While New York State leads in agricultural matters it is a fact that thousands of dollars in wax are wasted annually and it will pay to gather up the slum gum or buy the combs from your neighbors and save what is usually thrown away.

REGULATING PRICES OF HONEY*

W. D. WRIGHT, ALTAMONT, N. Y.

The question, "What method can be adopted to maintain prices on honey?" has been put to me. This is a difficult problem and I do not expect to solve it. The question appears to me to be somewhat in the abstract and not covering the matter fully.

It certainly will be no trouble to maintain present prices for this season, and the beekeeper is inclined to consider them fairly good for the reason that for a couple of years a slight advance has been experienced, attributed, no doubt, to the reduced production caused by adverse weather conditions.

The prevailing high prices of other food products should have an influence on the price of honey, which as an article of diet stands far above many other higher priced commodities, but it is not yet evident.

I deem it essential to not only maintain the present prices but when conditions warrant it, to work for a gradual increase until honey producers receive adequate returns for their strenuous labor, and for the capital and brains expended in the business.

The question of price rests to some extent, especially in the retail trade, with the producer himself who frequently sets entirely too low a value on his products, and fails to consider the actual cost in time, labor, investment, etc., with a reasonable margin of profit added.

To many producers, the middleman is a necessity, but without regulation by the producer he is a parasite that is sapping the resources of the business.

The critical period of honey production is at the commencement of the marketing season when the price is established, and instead of the producer and dealer working in harmony, the dealer acts as a bear on the market and places prices at the lowest point that the producer will stand, so that he may readily move large quantities of honey at a good profit to himself. After prices are estab-

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lished there seems to a general understanding among dealers to hold pretty strictly to them.

Early in the season the interests of producer and dealer are in unison, since both desire a good crop of honey; later when that end is reached the ways diverge until finally they are almost antagonistic.

Our country is so extensive and climatic conditions so varied that the honey crop is harvested at different periods, so that it would be almost impossible and impracticable to consider the entire yield in fixing approximate prices; but since the bulk of the supply is produced in the northern states and California, I believe a fairly complete report from these sections would enable a representative body of producers to reach a reasonable conclusion as to what the market would stand and afford a reasonable return to the beekeeper.

These results can be attained only through cooperation, the method of which must be determined by the beekeepers' organizations.

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